NEWS IN BRIEF

Productivity talks at ICL

A MEETING between ICL and union representatives earlier this week considered proposals for the next self-financing productivity scheme. The present scheme finishes in September, at the end of the company's financial year.

It is believed that the unions will be seeking a number of important changes to the scheme, if it is to continue, including the consolidation of bonus payments into basic pay.

Takeover

EXPANDING South-Coast bureau, Jackson Associates of Chichester, has taken over another company in the town, PS Computing Services. The turnover of the new combined concern will be roughly £1 million in 1978. Jackson Associates recently bought Scope Computing Services (CW, July 13).

DEC profits up

CONTINUING to grow at an impressive rate, Digital Equipment has reported worldwide sales of $1,426 million for its 1978 financial year ended July 1, an increase of 30% over the previous year. Net profits were also up — from $108 million to $142 million.

NCC appointments

THE names of the remaining members to be appointed to the Technical Advisory Committee of the National Computing Centre have been announced. They are: Reg Boot, NCC development director; John Leighfield, director of systems at Leyland Cars; Professor David Aspinall from UMIST; and John Pearce, managing director of Insac.

CDC buys one-third share in OCR maker Scandata

A LOW-COST OCR page reader and a high speed OCR document reader both built in the US by CDC, are now being sold in Europe by OCR specialist, OCR Scandata. This follows a deal signed between its US parent, Scandata Corp, and CDC, under which the latter has acquired long-term notes and preferred stock that would give CDC a one-third share in Scandata if converted to common stock.

The low-cost page reader is called TOCR, Terminal OCR, and can cost as little as £20,000. TOCR can read OCRB fount and numeric hand-printed characters at a rate of up to 884 cnps, which means that it can process five full 9 ½ x 11 inch pages per minute. It can be used as a terminal device to a mainframe or as part of a mixed media data entry system.

The document reader is the CDC 929 which can read single line documents at a rate of 1,200 a minute. It can recognise any two of four different founts — OCRA, Farrington 7B, OCRB numeric and E13B numeric.

Scandata says that CDC has transferred its inventory of 929s and TOCRs to Scandata under the deal between the two firms. TOCR will definitely continue to be manufactured either by CDC or by Scandata, but the continuance of 929 manufacture will depend on how many 929s are sold by Scandata.

● The agreement between Scandata and another US-based OCR firm, Optical Business Machines of Melbourne, Florida, under which OCR Scandata sold OBM's Laser OCR-One system in Europe, has been terminated. OBM has set up its own European subsidiary, Transworld Optical Business Machines Ltd.

South Africa aims for DP independence

TO beat any ban that may be imposed on the sale of computer equipment to South Africa, the government there is looking at the possibility of stepping up home production, and may even go into mainframes and CPUs. But this is still very much at the discussion stage.

A meeting was held last week under the auspices of the SA Computer Society entitled "The Domestication of the South African Computer Industry". Several companies at the moment are making components and terminals, some of which are even being exported to Europe, but a full-scale manufacturer is still only a talking-point.

The government-backed Council for Scientific and Industrial Research is interested in the manufacture of certain units of computer systems, but feels that most work would have to be done by private companies, possibly with government backing.

Meanwhile, reports that ICL is planning to set up a factory in South Africa have been denied by the company. Peter Hall, director of corporate communications, said, "We are not thinking of setting up a manufacturing capability there."

On the suggestion that ICL was looking for a South African software house to buy, Hall said that the company was always looking for ways to strengthen its software operations, but there was nothing particular about South Africa in this respect at the moment.

The same was true, he said, about refurbishing plants in South Africa. There was no particular intent to expand these at the moment. "We have plans to expand in all our territory," he added.

ICL has had considerable sales success in South Africa since the US companies pulled out because of their government's boycott. The latest sale, to the police, was revealed last week (CW, August 10).

Rent rise upheld

THE Price Commission has upheld IBM's increase in the annual rental payable by UK users of its CICS teleprocessing monitor. The case was taken to the commission by the CICS Guide User Group, which complained that the price rise, from £5,000 to £6,000, coincided with a reduction in the level of support (CW, June 22).

Council system finds model plane winners in minutes

COMPUTER staff from Merseyside County Council came to the rescue of competitors in the Federation Aeronautique Internationale Model Flying World Championships held at RAF Woodvale, Southport, last week when they used the council's ICL 1904S system to cut down the analysis time of scores and positions from the usual weeks to a matter of minutes.

Installing an ICL 7502 terminal system and four VDUs in a caravan at the air base, Merseyside computer staff took score cards marked up by judges and input the data via the VDUs into the ICL 1904S which is based in Liverpool, a Post Office line being used to send the data.

Then at about 15 minute intervals up-to-date positions and scores for the five competitions — combat, aerobatics, speed, team race and radio control — were produced.

Also, every evening, end-of-day results were printed out and despatched to Liverpool University where the competitors stayed, and following a draw to decide the next day's flying order, a print-out of this was also made.

● In the picture, David Holt (foreground), Merseyside's chief programmer, checks some of the scores, while behind him is Mike Shaw, deputy director of Merseyside's joint computer unit, and Phil Langman and Bernadette Coyne, both Merseyside council programmers.

Cray introduces own front end

A FRONT end processor for the Cray-1 will be introduced next year by Cray Research. It is to be offered as a purpose-built alternative to the IBM and CDC mainframes that need to be used as front ends at the moment.

One existing Cray-1 user, the European Centre for Medium-range Weather Forecasts at Shinfield Park, Reading, has a CDC Cyber 175 front ending its machine. The director of the centre, Dr Wiin Nielson, told Computer Weekly, "It is unfortunate that Cray Research did not introduce its front end processor a year or two ago, but we are now committed to the Cyber 175 for some time."

Cray says that its front end processor will be more tailored to the Cray-1 than the IBM or CDC machines used at present.

BCS competition for students

A SECOND computing competition for students is to be held by South Yorkshire branch of the BCS during the next academic year. There will be a section of the competition each for students from schools, colleges, polytechnics, and universities in the South Yorks area, and prizes will be awarded for different age groups and curricula followed.

Entries may consist of a description or analysis of a particular aspect of computing, or a definition of a program or system designed for a specific purpose. The intention is to encourage a wide range of entries from students in the arts, commerce, engineering and science, as well as computer science.

Honeywell offers low cost version of Level 62

A LOW-COST packaged version of the Honeywell Level 62 small business system has been introduced which lowers the minimum price of a Level 62 configuration to £46,350.

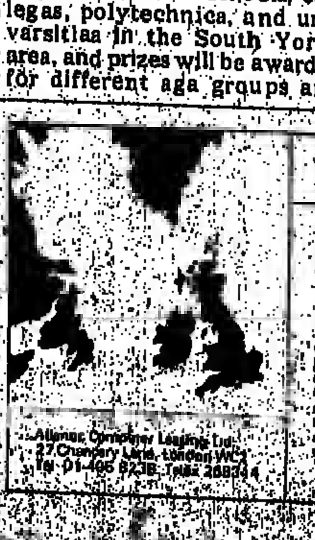
The new model, called the 62/10, is aimed at first time users, who are now offered an extended on-site growth path right up through Level 62 without having to alter their software as they grow.

The minimum configuration includes a 128K-byte processor with console, two 40 Megabyte disc drives, a 300 lpm printer and all communications controllers and ports. For those who want to attach terminals from the start, a 62/10 Distributed Systems Environment configuration with the same processor, discs and printer, and three asynchronous display terminals, costs £50,400. For a 192K-byte transactions processing system with the same complement of peripherals, the price is about £58,000.

Level 62, which has had several successful years competing directly with IBM's System 3 line in a predominantly batch environment, is fast evolving into a product oriented towards online transaction processing.

There are now five models in Level 62, the 10, 20, 40, 50 and 60, and users can field-upgrade right through the line.

● UK Level 61 users want easy upgrade — see page 9



Printed in Great Britain by Q.B. Limited, Sheepen Place, Colchester, CO3 3LJ, and published by IPC Electrical-Electronic Press Ltd, Dorset House, Stamford Street, London SE1 9LU.

COMPUTER WEEKLY
Number 615 Thursday, August 24, 1978 Price 18p

Briefing

GA beats IBM into Citibank

AGAINST fierce competition from IBM with the Series 1 minicomputer, General Automation has won a major contract from Citibank of New York to supply hardware for a US-wide banking network.

The system involves 11 centres, each of which is to be equipped with dual GA 10/100 minicomputers. The contract, worth $5.5 million over two years, also involves hundreds of GA 16/220 two-board microcomputers. IBM bid complexes of five Series 1s at each centre with no local intelligence.

Union talks at ICL

FURTHER talks are to take place between ICL and staff unions on the possible format of the self-financing productivity scheme for 1978/79. Following a meeting last week at which the company set out its proposals (CW, August 17), another meeting has been arranged for September 22 in Birmingham.

Micro impact

UNION officer Tim Webb of ASTMS has called on the Manpower Services Commission and the Engineering Industry Training Board to set up a joint study on the effect of microprocessors on employment, with particular reference to the problems of retraining.

Standard warning

IF the US government adopts the US National Bureau of Standards proposal that IBM's 360/370 I/O interface should become a standard (CW, July 27), Honeywell will withdraw from bidding for new US federal systems business, Honeywell's vice-president Steve Jerritts, said this at a meeting of the NBS Institute for Computer Science

Cancelled

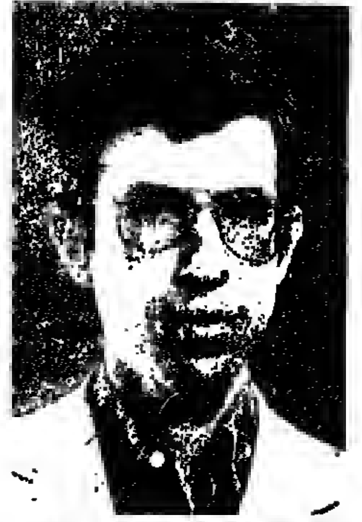
THE trade secrets squabble between Mostek and the NEB's Inmos venture is now likely to be settled out of court following the cancellation of this week's Dallas court hearing by a Texas judge. Four more former Mostek employees have joined Inmos and the US company was concerned that technical information would be divulged (CW, August 17). Inmos director Iann Barron said that he expected the matter would be settled soon.

GEC's Pascal

A PASCAL compiler is being developed by GEC Computers for its 4000 Series machines. The software, including a stand-alone compiler and associated [illegible] library routines, will [illegible] under the OS operating [illegible] and will be available in

[illegible] success

[illegible] having their request for [illegible] turned down (CW, [illegible]) one of the operators [illegible] at Brighton [illegible] regarded [illegible] to the South [illegible] Council [illegible]



OAVID LEVY . . . agreed to an extension.

Toronto climax to 10-year chess challenge

THE 10-year-old computer chess challenge, worth £1,250, between international chess master David Levy and four computer scientists, is to reach its climax in Toronto in a match of six games, starting on Saturday, August 26.

A wager was struck in August 1968 that Levy would not lose a match to a computer chess program within 10 years. Although the deadline is August 31, Levy has agreed to an extension to September 5 so that the final games can be played at the Canadian National Exhibition in Toronto.

This match will be against the Chess 4.7 program, an upgrade of the world computer chess champion, Chess 4.6, developed by David Slate and Larry Atkins of Northwestern University, Chicago. It will be run on a CDC Cyber 176 at CDC's manufacturing centre in Minneapolis.

Levy has also agreed to a two-game challenge match at the Massachusetts Institute of Technology, against the MacHack program running on purpose-built hardware called Cheops, which was developed at MIT by John Moussouris, under the direction of MacHack's author, Richard Greenblatt.

There is great disappointment among computer chess enthusiasts that Slate and Atkins have been unable to get the latest upgrade in their program, Chess 5.0, ready in time for the grand finale. It had originally been planned that Levy would play Chess 4.7 in Phoenix this month and then Chess 5.0 in Toronto (CW, August 3) but the Phoenix challenge was cancelled through lack of finance and Chess 5.0 has not yet been developed to full match fitness.

Computer Weekly's regular Chesslab editor, Professor Donald Michie of the machine intelligence unit at Edinburgh University, is one of the academics who have challenged Levy. He has said, "Win or lose much interesting work and some exciting moments will have been generated by the wager. So even an adverse outcome would not leave me disconsolate."

Professor Michie's Chesslabs, over the past year, have provided Computer Weekly readers with an insight into some of the intellectual and systems issues involved in the study of computer chess and Levy has said that the advances in computer chess over the past 10 years have been great and that the result of the wager has been in the balance for some time.

● Levy would like us to point out that the figure quoted by Professor Donald Michie (CW, August 3) as his performance fee in Toronto is inaccurate.

Electronic mail draws nearer

ELECTRONIC mail, another aspect of the automated office, is also drawing closer with the imminent emergence from IBM and Xerox of sophisticated facsimile and message switching systems. Industry sources in the US believe that Xerox is developing an advanced communications network, and point to evidence that IBM is about to produce a facsimile device.

Howard Anderson, of the Massachusetts consultancy The Yankee Group, claims that IBM has placed an order for 30,000 4800-bps modems from Paradyne, and that these are to be used in a facsimile-type device.

Anderson also believes that Xerox will announce within the next few months a store-and-forward facsimile service.

ADVANCE TOWARDS THE AUTOMATED OFFICE

Three in battle for intelligent copier

THE all-electronic office will soon be much closer to reality, as a word processing product, currently under test by three separate manufacturers, comes on to the market. This is the "intelligent copier", a device which combines the functions of copier and xerographic printer, and which promises to form the basis of integrated office systems of the future. (writes Rory Johnston).

The three companies known to be well along the road on intelligent copiers are Wang, Xerox and Toshiba. The Wang machine will probably reach the market first. This will start field trials in a few weeks. Estimates of its eventual sale price range from $15,000 to $30,000.

The Xerox machine, called the Advanced Multi-Function Workstation, is still very much an experimental model, but is being field-tested by, among others, President Carter's staff in the Executive Office Building in Washington. Two units have been in use there since May.

The principle behind all the machines is the same. They act as printers for a word processor by generating characters in a high-resolution dot matrix by hardware, and "painting" the characters on to the drum of a xerographic copier, either by

● Turn to page 16

SRC £10m robotics research

FIVE years after it published a report throwing cold water on research into robotics, the Science Research Council is likely to initiate a £10 million research programme into the subject.

The SRC panel investigating new areas of application and technological developments for microelectronics has decided to single out robotics for special attention, and is recommending that a separate panel be set up to control the placement of research grants for robotics.

The micro applications panel, headed by Plessey Microsystems managing director Derek Roberts, is due to provide its full report to the Engineering Board of the SRC in October.

The Roberts panel is also currently studying image processing and automatic inspection, a possible large multi-computer complex based on a variety of microprocessors, and a 32-bit "midicomputer" in chip form.

Initially, the total funding for research into all these was a suggested £5 million. The new recommendation for robotics alone doubles this figure.

In 1973, Sir James Lighthill produced a report for the SRC which suggested that progress in robotics and artificial intelligence had been disappointing and he saw little reason why the situation should improve (CW, May 24, 1973).

Over the past five years, however, the Japanese, Americans and West Germans have pursued robotics research with

● Turn to page 2

Call for national publicity campaign

MORE inquiries are needed into the effect of computers on the service industries, according to a report by the National Electronics Council. In addition, the report says, a national publicity campaign is needed to impress on people the importance of computers in society.

One of the Council's specific recommendations is that the National Computing Centre should set up a system of collating and analysing statistics on the social implications of computers, to help forecast changes in society.

Commenting on this, Eric Howe, of the NCC, said he thought it would be useful, but was not timely at the moment because of the government's current involvement through the Central Policy Review Staff.

The "Think Tank" should take this study under its wing, he said.

The National Electronics Council also suggested that the British Computer Society should study the effect of current plans on employment and education.

COMPUTER WEEKLY'S INSIDE NEWS

PERSONAL MARKET

One of the current boom areas on the always booming computer scene is the personal computing market. In the US there has been phenomenal growth over the past two years and in the UK and Europe the market is now beginning to catch fire. This week's special section deals with the "home brew" systems and also the much wider fields that now come under the general heading of Personal Computing.
Pages 13/15

THE MESSAGE

Chad is convinced that TV, books, comics, and so forth must try to make our young and not-so-young people computer-conscious. Readers are asked to submit their ideas on how this can be done, with prizes to be won by the best.
Page 4

STAFF SHORTAGE

One of the major problems facing computing services companies is the shortage of skilled staff. Alan Benjamin analyses the situation and offers some practical solutions.
Page 18

ALSO . . . . .

JOBS: PAGES 20-38

COMPUTER WEEKLY

Vol. 25 No. 615
Thursday, August 24, 1978

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Published weekly on Thursday
Registered at the Post Office as a newspaper. Price per copy 18p

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Controlled Circulation Department: IPC Business Press (Sales & Distribution) Ltd, 40 Bowling Green Lane, London EC1R 0NE. Tel: 01-837 3636.

Subscriptions for readers outside the above categories: One year, UK £14.50; overseas £20; USA, Canada $52. Students £7.50; overseas £10; USA, Canada $26. Airmail rates on request. Subscriptions: IPC Business Press (Sales & Distribution) Ltd, Oakfield House, Perrymount Road, Haywards Heath, Sussex RH16 3DH. Tel: 0444 59188.

Back numbers can be had as available for any past free.

Computer Weekly has a circulation each week of over 82,000 including the highest fully requested circulation in the UK. The international edition, which is published 18 times a year, has a circulation of over 84,000.

ISSN 0010-478

When computers become the mind expanders

THE microprocessor had led to a deluge of words recently that has attributed to this ubiquitous technology a variety of effects ranging from killing work to opening up the greatest industrial opportunities since the first Industrial Revolution.

In fact, the micro itself is only one component in a wider range of information technology developments, such as the potential offered by new communications techniques (see page 9).

The unique attributes of the micro are cheapness and smallness. Larger, more expensive processors can perform the same functions as micros and, in terms of social impact, have as far reaching effects as the micro.

The qualities of low cost and low size, however, create the capability to spread computing and information processing techniques into vast new areas.

One of the most visible and understandable new areas is the "personal computing market." To some, personal computers are all about Star Trek games and DIY computing enthusiasts; to others it means small business systems or educational aids. The survey of the UK personal computing market (pages 13-15) highlights the great potential of the market however it is defined.

What is undeniable is that for the first time computing power has become cheap enough for individuals to develop their own personal interests rather than to use computing power on behalf of some large organisation that can afford the computing capability.

The effect of this is already dramatically on display at any personal computing show in the US, where the phenomenon has been growing for a number of years. For example, at the personal computing fair at the National Computing Conference at Anaheim this year (CW, June 8), a contents addressable file system, similar to that developed by ICL, was on display. However, it was not the work of a large company, but the development of an ex-Yale University professor whose primary interest is in linguistics.

University research provides an interesting study in the "mind expanding" potential of micros. In the past, projects requiring significant computing power had to have access to university computers. The falling costs of computing power not only make it easier for those already interested in the use of computers to gain access to processing power but, perhaps more significantly, it brings computers into the orbit of those people whose primary interest is in some other area.

The same situation is likely to happen in industry and other research establishments, with the result that there could be an explosion of new inventions.

The easy availability and "friendliness" of the personal computer also offers a tremendous potential for extending the understanding of the technology and the development of the skills that will be the powerhouse of a country's evolving industrial base.

In the US, the personal computing boom has already given that country an "ingenuity" boost, with a whole generation for whom the use of computers is as natural as pencil and ruler. Personal computers, as an educational aid, should therefore not be dismissed as a fringe activity, because it gets right to the heart of how this country — or any society — will develop during the information technology age.

FOCUS

THE DP industry seems to be enjoying an abundance of awards and competitions. Anyone who manages to keep pace with every project deserves a prize or, at least, a diploma.

But there has been a notable shift in prize-giving awards. A year or so ago, prizes involved trips to IFIP Toronto or Infotech Amsterdam which, it must be admitted, made a welcome break from trips to downtown Putney or Chiswick. Today's entrants have far more down-to-earth incentives. Computer Weekly, for long the industry pace setter, leads in the practical way.

The adjacent Interrupt feature awards £5 for notable, amusing or intriguing happenings in the computer installation. A spot of instant research reveals that many of the winning entries have the distinct advantage of an ability to reminisce at length about such veteran systems as Titan, Atlas and assorted 1401s.

Awarding prizes for all reasons

Not content with one regular cash award, Computer Weekly is now featuring a weekly £5 Op Spot prize for the best hint. Many DPMs would be surprised if there was a prolific response to this particular contest, operators not being noted for taking hints, unless specified in writing and signed and sealed.

For those whose time and writing abilities are in the more extensive mode, there was the Computer Weekly/Dataskil essay competition. This year's entrants were asked to explore how information technology would affect life styles by the year 2000. The winning submissions were predictably gloomy, with one joint first prize-winner, Bryn Jones (CW, June 8) particularly doleful about life in 20 years' time.

In fact, the common feature of all the winning essays was the lack of any mention of computer installations. Given the premise that life will be very much computer-controlled, the question of whose finger will be on the terminal keyboard was hardly explored.

It was significant, perhaps, that none of the winners were DPMs, being in the main computer consultants.

DPMs, however, do come into their own with the annual IDPM/Data Logic Management Award (CW, August 3). This, without doubt in my mind, is the industry's most prestigious award. It is given in recognition of outstanding management achievements and performance. It also serves to provide recognition of the vital role of DP management.

This year's winning DPM, Roy Hesling-Brown of Hornby Hobbies, won £250 plus a silver punch bowl and cups for management achievement in the face of enhancing his ICL System Ten. The runner-up, Andrew Lewin of J. H. Minet, was awarded £150 and a rose bowl for valour in the face of replacing an IBM 360/22 with a 370/125. The surprise was that both contestants had surplus energy and time to accept nomination.

Meanwhile, there is no shortage of other industry awards and contests. Computer Weekly alone has been involved in sundry competitions covering Othello (Zeus-Hermes) and school essays (Philips Data). Currently, it is all go for Computastars (see this page).

There is also, of course, the chance that this particular Focus will win the 1978 National Computing Centre Award for published articles. If so, the £500 prize should be sent c/o the Editor, please.

INTERRUPT

BACK in the pioneering days of computing everyone wanted to see what a computer looked like, and as we had the first transistorised machine in Europe, we had to put on a show for our directors. Standard hardware features then were loudspeakers and cathode tubes, both of which could be misapplied for entertainment purposes. We could produce Christmas carols on the loudspeaker and moving pictures on the display.

We decided to show our directors what I called GAT, Gunslinger Aptitude Test. A message appeared on the screen saying that when the word "Now" came up, the visitors were to press a specific button on the console and the reaction time in milliseconds would be displayed.

One of the directors was a doddery old chap, and so we had the foresight to remove the routine which displayed the message "Wake up" if the response time was more than a couple of seconds. We watched confidently as he took up his position. The trembling old hands reached out — and pressed the button before "Now," end up came the message "Cheat."

Moral: Beware of geriatric directors who may outshoot your programs.

● This week's £5 Interrupt prize goes to Ken Whyld of Caister, Lincolnshire.

Heavy demand for Computastars seats

REQUESTS for tickets for the Computastars finals at the Crystal Palace sports centre, South London, on Saturday, September 30, finals are now rolling in and several teams are bringing strong parties of supporters. Where block bookings are received in advance, seats for team members will be allocated so that competitors can join their friends while waiting for their events.

Tickets cost 50p for adults and 20p for children and each ensures a numbered seat under cover and provides access to refreshment and bar facilities.

To round off the day there is to be a disco for all competitors and their partners. Tickets cost £2.50 per person including food, and as the demand is heavy competitors are advised to book early.

Computastars has been organised by Goldsmith Recruitment International with the support of Computer Weekly.

TICKET ORDER

COMPUTASTARS

To: Computastars, Goldsmith Recruitment International Ltd, 15 Buckingham Palace Road, London SW1.

Please supply:

..........Adult ticket(s) at 50p each.
..........Child ticket(s) at 20p each (under 14).
for the finals of the Computastars Competition.

I enclose cheque/PO for .... made payable to Computastars.

Name ....

Address ....

....

....

PLEASE ENCLOSE A STAMPED SELF-ADDRESSED ENVELOPE

Ten years ago...

COMPUTER WEEKLY **AUGUST 22, 1968**

AN information retrieval system designed to meet the working needs of the legal profession was being investigated by a technical committee sponsored by IDH, a subsidiary of IPC . . . Top executives at ICL were to have video terminals in their offices linked to a 1903 computer, to provide up-to-the minute details of company activities . . . In the search for Camelot, a KDF9 computer was being used to process the results of a geographical survey covering a 40-metre square in Somerset . . . The conversational language, POP-2, developed by the Department of Machine Intelligence and Perception at Edinburgh University, was to be marketed in the UK by Systems Consultants . . . A study committee for French Technical Terms proposed that Anglo-Saxon words hardware and software be dropped in favour of matériel and périgramme. Some of the other suggestions were hardouére and softouére, quincaille and mentaille, nabla and biabla.

£10m robotics research

● from front page

great vigour and the recommendations of the Roberts panel support the views of Lighthill's critics that his report was incorrectly pessimistic on the subject.

The only company now making robot systems in the UK is Hall Automation of Watford, which has made about 100 systems; 80 of these have gone for export. It is shortly to announce a new robot based on a Texas Instrument TMS 9900, 16-bit microprocessor.

Union seeks curb on use of micros

A CALL for a law that would halt the introduction of microelectronics technology into any company unless prior agreement had been reached with the appropriate trade unions, has been made by Tim Webb, national officer of ASTMS. But Roy Grantham, general secretary of the Association of Professional, Executive, Clerical and Computer Staff, commenting on Webb's request, rejected the need for such a move, saying that instead of improving the situation it would be "counter-productive."

Head of APEX, the union that represents 153,000 members, and of which about 12,000 are in the computer industry, Grantham said that the law would be too much of a constraint on many companies and, if implemented, might force some of them to "go to the wall."

"Rather than protecting some jobs, all the jobs in that company would then be lost," he said.

What trade unions must seek, Grantham added, was a traditional solution to the problem, not a local one. "We must change society's attitude. We must create a society where the consequences of this technology can be absorbed."

Webb

The proposal is one of eight that Webb feels should comprise a co-ordinated national campaign by the TUC to protect workers' job security. He outlines these in the latest issue of the ASTMS Journal.

ASTMS represents 441,000 members in scientific, technical and managerial positions.

The other proposals are that there should be a 35-hour working week no later than the end of 1979; holiday entitlement be increased to a minimum of five weeks and the age of retirement lowered to 60; voluntary sabbatical leave after seven years' service; the Manpower Services Commission and the Engineering Industry Training Board jointly to examine the effects of adopting microelectronics with emphasis on retraining aspects; workers made redundant to receive full pay until suitable alternative employment or retraining can be found; and that pay controls should be lifted to allow UK electronic companies to recruit key staff.

Under the heading "Is Small Really Beautiful?" Webb writes that "the impact of the microprocessor has been likened to a second industrial revolution . . . there is no doubt that the silicon chip or integrated circuit has already made a major impact on certain industries."

He cites the Swiss watch industry, hit by the digital quartz watch boom, and electro-mechanical calculator manufacture, hit by the low-cost electronic pocket calculator, as two victims of the advancing incursion of microtechnology.

Despite disagreement on the first point, Grantham and Webb agree on the inability of society to handle the problems thrown up by this incursion.

"It is my view that our present structure of society and industry does not have the proper social basis to deal adequately with the forthcoming changes," said Webb.

ICL likely to oust Univac at Treasury

A BIG new government installation looks like coming ICL's way soon from the Treasury, which is planning to replace its Univac 1108 multi-processor.

The 1108 is operated by the Central Statistical Office on behalf of the CSO and the Treasury, and was installed in 1973. The Univac system was chosen despite the government's single tender procurement policy because ICL did not bid for the contract, the main reason being that it had no system at the time that could handle the applications required.

Applications include economic forecasting, which involves large scale databases, and processing statistical information. The workload comprises a mixture of terminal access and batch processing.

A CSO spokesman said that no decision had been made yet on precisely what machine would replace the Univac 1108, but confirmed that the order would be placed "in accordance with government procurement policy."

No information was forthcoming about the software conversion task that would be involved in moving from a Univac system to an ICL 2900 machine, but the CSO spokesman pointed out that most of the programs that run on the 1108 were written in high level languages.

Construction of a purpose-built complex, to house the new system in the courtyard of the Treasury building in Great George Street, Whitehall, will start next year.

Public access laws 'self-defeating'

—WARNS EX-CIVIL SERVICE CHIEF

LAWS to give the public a right of access to all government records could be self-defeating and have the opposite effect to that intended, according to Lord Croham, former head of the Home Civil Service.

Speaking on BBC radio about proposals for a Freedom of Information Act, Lord Croham said that in the US, where such an Act has already been implemented, there were the beginnings of a predictable tendency for officials to put things in writing as little as possible to avoid the danger of embarassing disclosure.

Thus the information that the Act was meant to provide was not available at all, even to future historians. "A government determined not to release analytical material would soon ensure that there was no analysis to release," he said.

A further difficulty, Lord Croham said, was that government departments did not keep unified catalogues of all their records, and to set up a central catalogue would be very expensive. Thus anyone from outside looking for a certain document was only assuming that it existed, and it might be very hard to find under the description given.

While agreeing that the degree of secrecy traditionally maintained in Whitehall was damaging rather than helpful to good government, as was illustrated when he was in office in 1977 in a government decision to release more background information on decisions.

Volume order

THE first volume order for the Digital Equipment PDT 11 intelligent terminal has been placed by Midlectron of Belper, Derbyshire, which is to take 50 of the terminals. The PDT 11 incorporates DEC's LSI-11 microcomputer and is built around DEC's VT100 video terminal.

A PILOT installation of 30 NCR 255 supermarket checkouts has been established at the Hyde, Manchester, superstore of the Fine Fare group, as the first phase in what could be a major point-of-sale system covering 25 superstores and over 700 other outlets.

The Hyde 255s are due to go into operation in October and will be linked to an NCR 726 instore mini with a second 726 as back up. Initially product data will be keyed in but, in preparation for the use of laser scanners, Fine Fare has placed an order for 60 million labels with Thomas Forman and Sons, of Nottingham. These labels will carry the Article Numbering Association's eight-unit bar code and Fine Fare claims to be the first UK company to use this for its own products.

● Here Forman's litho machine room manager Stan Messom (right), and machine manager Jock Crabtree, check the bar coding on labels for cans of peas.

'Personal' loss at Pertec

INCREASING competition in the personal computer market, coupled with declining revenues in the purely hobbyist market for such equipment, has led to Pertec's Microsystems Division posting its third consecutive quarter's loss.

Ryal Poppa, Pertec chairman, says the losses stemmed from a lack of penetration into the growing small business system market, and inadequate attention to the needs of the division's network of 70 dealers.

Speaking at the firm's annual meeting in Marina Del Rey, California, he said that following this current quarter's loss the division, which makes Mits Altair and iCom equipment, should break even by the end of the year, and enter profitability in the quarter after that.

● The division's parent company, Pertec Computer Corporation, is selling 1 million shares of common stock on the open market, the proceeds of which will be used, according to Poppa, "to retire bank debt."

DOWNTIME

by Chad

Timber—thar she blows...

IT isn't just greedy capitalists who use computers to mass-produce junk mail. The International Whaling Commission in Histon, near Cambridge, is being flooded with thousands of identical letters produced on word processors by whale lovers, mainly in the US, protesting at the threat to whales and demanding that catch quotas be cut.

The US Whale Protection Fund alone has produced 74,000 letters, and they are still pouring in, despite the fact that the meeting for fixing the quotas was two months ago. The IWC doesn't bother to open the letters any more, but just gives them to local stamp collectors. It's nice to see somebody benefits.

Whales are all very well, but how about the trees used to make all that paper? I would have thought that the Whale Protection Fund would start to get protests from the Save-A-Tree people. Messages written on whalebone, perhaps.

Courses—foiled again

In autumn, when the
nights close in
And leaves from trees
(deciduous) do fall,
When summer's outdoor
exercises (strenuous)
Eventually, and squelchingly,
appal:
When harsh reality, like
statements from the bank,
Chills one's hopes, however
noble:
Then is the time, the polys say,
To take that further course in
Cobol:
And PL/1, or RPG,
Or structured programming
(all three?) —

But wait: unlike the
ploughman, now
That weary homewards
way I'll tread:
Take aspirin (two),
retire from view
And nurse my stinking
cods instead.

den

Inmos comes of age

DOUBTLESS you were distressed to read that our gallant lads at Inmos, nobly leading Britain forward into the 20th Century, have been taken to court by those horrid Mostek people. But do not despair — it is simply an initiation rite into the arcana mysteries of the semiconductor business. It means Inmos has been accepted into the fold.

The US companies in the field spend half their time and energies suing each other over patents and so forth — it's part of the game. One pundit gave his advice to American mothers: "If you want your son to get into semiconductors, send him to law school."

Text fax

WORD processing has more than its share of baffling jargon and buzzwords. To help you out, the WP people at Logica, in their idle moments (Wow! They actually have some!) have produced a glossary entitled "All the fax you don't need to know about text processing and wouldn't dream of Ascling." Here are a few samples from it:

floppy disc: backache
twin floppies: hernia
inter-job transfer: sacking
scroll: parchment
sideways scroll: Chinese parchment
multiplexing: confusing in several ways
flash suppressor: rain coat
fact-simile: lie
intelligent fact-simile: big, believable lie
look-up table: front row at the Folies Bergeres
voice recognition: oh?
film strip: blue movie
global search: HM Customs
debugger: systems analyst (from Ancient Pidgin English: "so dat's de b......")

DP technology without tears

I NOTE with interest that in Kenny Everett's "Captain Kremmen" cartoon strip in London's Evening Standard, the planet currently occupying the hero's concerns is called "Macro."

Is this part of a cunning underhand plot to make us more aware of computers and the information technology On Which Our Future Society Will Depend? I shall follow the strip carefully, looking out for subtly-slipped-in computerisms.

Memories are coming back to me from my mis-spent youth, of an idea Mad magazine had during the Sputnik scare. They thought the media should try to make American youth more science-conscious. Among their suggestions: The Lone Ranger describing the chemical reactions in his cartridges after having shot the baddy; a Peanuts cartoon of Lucy explaining the ballistics of sending Charlie Brown POW! and best of all, a strip show cum chemistry lesson:

Girl singer:
I'm a cat — cat — catalyst, a
name that may sound strange,
But a catalytic agent can
cause a chemical change.
Chorus line:
Just watch her dance and
you'll soon see
That what she says is true.
Singer:
So light your Bunsen Burners,
boys, and let me act on you!

You get the idea? The possibilities for this sort of thing in the computer field must be enormous — and, you will agree, vitally important for our future if Britain is to take its rightful place in the vanguard of our technological Wonderful World.

Any ideas from you, dear readers? Send them in, and I will print the best ones. There will be £5 prizes for each one printed, to say nothing of the instant fame, scriptwriting contracts with ITV, etc.

"Mrs Groves is complaining that computers will end confidentiality between doctor and patient..."

Pendulum pitfall

I NOTICED the other day that our trail-blazing pioneer in the groves of academe had notched up another first — the discovery that the Earth revolves, a new turn of the wheel of technological revolution. Or at least that was the implication of a Guardian caption to a photograph of Canon John Collins and Professor Michael Pentz watching "as a 208ft pendulum is suspended from the dome of St Paul's Cathedral — part of an Open University experiment on the Earth's rotation..."

Eppur si muove, as Galileo said, and got an F for Fail in his TMA (tutor-marked assignment).

● IT'S not often one reads something earth-shattering in a house magazine, but the latest issue of Digitales, from Digital Equipment UK, is very revealing. A readership survey asked, "Who else reads your copy?" and the answers given were: 180 spice (see Downtime, July 13), 33 children, 45 relatives, 38 friends, and one dog. Makes you sit up and take notice (or beg).

GUEST PRIVATEVIEW

What is Prolog?

In this Guest Privateview, DAVID WARREN, Research Fellow in the University of Edinburgh Department of Artificial Intelligence explains why programming in Prolog takes much less effort and reduces the probability of error, compared with the use of other high-level languages.

PROLOG is a general purpose programming language, of an unusual kind. It doesn't have a goto. More surprisingly, it doesn't have an if or a while either. It also does without that essential ingredient of conventional programming languages — assignment. Nevertheless, Prolog is a perfectly practicable language for writing "real" programs, and many tasks can be programmed as efficiently in Prolog as in other, more familiar, high-level languages — assuming that the Prolog program is suitably compiled, for example by the compiler we have produced at Edinburgh for DECsystem-10.

People choose to program in Prolog (rather than other high-level languages) mainly because they find that the programming takes much less effort, and that they are less likely to make mistakes.

Prolog was originally developed at the University of Marseilles as a tool for research into computer systems to understand natural language (such as English or French), but it has since been put to practical use in a number of areas outside pure research. Examples include a package for doing algebraic "symbol crunching," an architectural design aid to assist in planning the layout of a building, a system to help predict the properties of organic compounds (needed in designing drugs), and the implementation of a compiler. All of these are large and complex programs which would probably never have got written at all with the available manpower, were it not for the relative ease of writing them in Prolog.

The name stands for "programming in logic," as Prolog is actually based on a simple form of symbolic logic. However, the language is remarkably simple, and quite easy to understand without any specialist knowledge of either logic or computers.

A Prolog program consists of a sequence of statements called clauses. Here is a simple example, consisting of six clauses:—

```
descendant (X, Y):— offspring (X,Y).
descendant (X,Z):— offspring (X, Y), descendant (Y,Z).
offspring (abraham, ishmael). offspring (abraham, isaac).
offspring (isaac, esau). offspring (isaac, jacob).
```

Clauses can be understood in two ways. Firstly, they can be interpreted as statements of fact. For instance, the first clause says that, whatever may be the values of the variables X and Y, "Y is a descendant of X if Y is one of the offspring of X." Similarly, the last clause says that "Jacob is one of the offspring of Isaac." Note that variables in different clauses are considered distinct, even if they have the same name.

The second way to understand clauses is as pieces of program. Each clause corresponds to a "case" of a procedure. Looked at in this way, the first clause can be read as, "To find a Y that is a descendant of X, find a Y that is one of the offspring of X," and the last clause as, "When seeking an offspring of Isaac, return the solution Jacob."

The six clauses of the example serve to define two procedures, named 'descendant' and 'offspring.' Each clause consists of a head, or "procedure entry point," followed by a (possibly empty) body. The body consists of a number of goals, or "procedure calls."

How does a Prolog program actually work? To run the program, one provides an initial goal such as:

```
descendant (abraham, X)
```

The result of executing this goal will be to enumerate descendants of Abraham and return them, one by one, as values of the variable X.

To execute such a goal, the Prolog system matches it against the head of some clause and then executes the goals (if any) in the body of that clause, in left-to-right order. In seeking a match, Prolog tries the clauses of the procedure concerned in the order they appear in the program. The matching process, known technically as unification, succeeds if the goal and clause head can be made identical by "filling in" suitable values for the variables. For example the goal 'offspring (X, ishmael)' matches the first clause for 'offspring' if X is given the value 'abraham'. When one solution to a goal has been finished with, or when no match can be found for a goal, the Prolog system backtracks. That is, it goes back to the most recently executed goal, and looks for an alternative match.

So what happens when the initial goal 'descendant (abraham, X)' is executed? Through matching the goal against the first clause for 'descendant,' Prolog starts by looking for the immediate offspring of Abraham, and returns successively X='ishmael' and X='isaac.' Then backtracking causes the second clause for 'descendant' to be used. This results in the 'descendant' procedure being called recursively for each of the offspring of Abraham, giving further descendants, Esau and Jacob.

So far, the only data objects we have seen have been unstructured constants corresponding to names of people. Prolog also provides for structured data. An example is the lists manipulated by the following concatenation procedure:

```
concatenate (nil,L,L).
concatenate ( (X.L1), L2, (X.L3) ):— concatenate (L1,L2,L3).
```

A Prolog list is either the constant 'nil' or a structured object such as '(X.L)' where X is the first element of the list and L is a variable standing for the remainder, or "tail," of the list. Executing the procedure call:

```
concatenate ( (1.2.3.nil), (4.5.nil), L)
```

produces as value for L the list '(1.2.3.4.5.nil)'. However the 'concatenate' procedure can be used much more flexibly than this. For example, execution of:

```
concatenate (L1,L2,(1.2.3.nil) )
```

will return, as successive values for L1 and L2, all pairs of lists which when concatenated give the list '(1.2.3.nil)'.

As a final, more meaty, example, there follows a Prolog version of Hoare's "quick-sort" algorithm. The interested reader should be able to figure out how the program works from what has been said already. As an example of how it is used:

```
qsort ( (1.9.7.5.nil),nil,L)
```

returns '(1.5.7.9.nil)' as the value of L.

```
qsort (nil,L,L).
qsort ( (X.L),R1,R):—
    split(L,X,L1,L2), qsort(L1,(X.R2),R), qsort(L2,R1,R2).
split(nil,Y,nil,nil).
split ( (X.L),Y,(X.L1),L2):—X≤Y, split (L,Y,L1,L2).
split ( (X.L),Y,L1,(X.L2) ):—X>Y, split (L,Y,L1,L2).
```

Reference

"Prolog — the language and its implementation compared with Lisp," by Warren, Pereira and Pereira. In Procs. ACM SIGART-SIGPLAN Symposium on AI and Programming Languages, Rochester, New York, Aug. 1977.

Estate agents bring computers to the high street

TWO West London estate agents are claiming to be the first in the country to use computers in the personal home buyer market.

The companies are Chadwick Bird, of Chiswick High Street, and A. A. Dickson, of New King's Road, Fulham, who are both using a Wang 2200 system to assist clients in buying and selling homes.

Bill Bird, of Chadwick Bird, said that the computer system could do the work of two people in one tenth of the time. "The computer has also helped in enhancing the human side of the business because we have been freed from some routine chores, allowing us more time to give personal attention to clients' needs," he added.

Despite the improved efficiency offered by the computer, Bird said that he is likely to take on extra staff because the Wang system enabled him to handle more work.

Bird learnt about the system from his friend Andy Dickson, who was the first to install the Wang, which uses software developed by Vallmore Computer Services of Fulham, London.

The systems run in the offices of Bird and Dickson can be linked, to extend the housing available to the companies' clients.

The desk top Wang machine is used to interrogate a database of available houses and flats. The requirements of the home buyer are input to the system specifying, for example, price range. A list of suitable properties is then provided on the screen. As a bonus, it can also calculate mortgage repayment rates.

The service is greatly appreciated by house sellers as well as purchasers. Bird said that a flat was recently entered into the computer database at 9.30 one morning. Within half an hour, eight appointments had been made and it was sold the next day.

Bird said that he would have preferred to buy a British system, but he did not see anything that could match it on price/performance.

One of Bird's clients commented after using the service, "I have sometimes felt that computers were the unacceptable face of automation but this system has shown that the computer has a role in the high street for the visible benefit of ordinary people."

ICL to close six US centres by end of 1978

AS part of a major shake-up of its US operations, ICL is to close down five of its 11 offices by the end of the year, and is to combine all its north and south American operations under a single vice-president.

This follows a year in which ICL operations in the US ran at a loss, and the rejection earlier this year of a report on US companies which could be acquired by ICL as part of its expansion in the US.

The report was carried out by ICL staff in the US, but when it was presented to the ICL Operations Review Committee in London, it is understood that the recommendations were rejected on the grounds that Europe will be given priority over the US as ICL's key area for growth.

ICL refused to comment on the deliberations of its Operations Review Committee. A company spokesman said however, that ICL was making significant investment in its marketing operations in the US and its manufacturing plant at Utica in New York State.

Commenting on a suggestion from an industry source that ICL had lost £1 million in the US last year on a £4 million turnover, the spokesman admitted that there was a loss on its US operations but said that this was much less than the suggested figure and pointed out that the loss included overhead costs which are part of the establishment of new operations.

As part of the Americas reorganisation, ICL is also closing its Americas headquarters in Atlanta, Georgia, in addition to the five sales offices. The new headquarters will be in East Brunswick, New Jersey, which has been the headquarters of its US operations.

An indication of ICL's intention to continue playing a significant role in the US, even if at a lower level than that suggested in the report on acquisitions, is given by the appointments of the men who will take over the ICL Americas operations, Dick Bright and Bill Ford.

Both are US nationals and one source who knows them well commented that they would take responsibility only for these operations if they believed in ICL's intention to attack the Americas market with renewed vigour.

Bright, formerly vice-president of ICL's Pacific operations, becomes the Americas vice-president.

Emphasising the importance of strengthening the sales operation in the US, Bright will also directly manage sales and marketing in the US.

Ford, who has been systems and technical support manager for ICL's international division, is appointed to the new post of general manager for Latin America and OEM sales and will be responsible for activities in Mexico and South America.

According to ICL, the two previous senior men in the US, Americas vice-president Spud Taylor and Geoff Rowell, president of the US marketing division, are returning to take up senior appointments in the UK now that their "tour assignments" in the US have come to an end.

British Relay forms a viewdata division

PRESTEL information provider British Relay has formed a new viewdata division to design, manufacture and supply viewdata systems to business and domestic customers.

The first units are expected to be available at the end of September using ITT and STC sets, renting at prices fixed by the Post Office at £14 to £18 a month. The company expects these figures to fall to £3 or £4 on top of normal TV rental as production increases over two or three years.

Future plans include coin operated models for public siting, and provision of closed user group services for businesses.

The company is organising a series of conferences to promote viewdata and its own services.

Ericsson wins Kuwait order

THREE Axe type computer controlled telephone exchanges have been ordered from L. M. Ericsson of Sweden by Kuwait's Ministry of Communication. Exchanges previously installed by Ericsson are also being extended under the contract, which is worth about £10 million.

Ericsson has also received an order from the Malawi government for crossbar and other telephone equipment worth about £2¼ million.

NCC calls for details of breaches of computer security

THE National Computing Centre would like to hear about any examples of breaches of computer security, to help with a study of security the Centre is carrying out.

As part of its educational and advisory services on security, the Centre wants to compile as thorough a file as possible of examples of security breakdowns, and then carry out an analysis.

The sort of incidents the NCC would like to hear about are: fire, equipment breakdown, operator error, malicious damage, tampering with files or programs, strikes, unauthorised disclosures of confidential data, and the like. Names of individuals and organisations will be kept secret if desired.

Those who have any information along these lines, are asked to contact John Pritchard at the NCC, Oxford Road, Manchester M1 7ED, telephone 061-228 6333.

This analysis of cases where computer-based systems have suffered loss of availability or confidentiality will be carried out by the NCC assisted by Adrian Norman, a consultant with Arthur D. Little. The results will be published as a supplement to the Centre's Management Handbook of Computer Security, which provides advice to DP managers on the nature of security problems and the techniques available to deal with them.

This looseleaf book has chapters covering the security aspects of physical environment, personnel, systems design, insurance, contingency planning, and auditing of security. It costs £80, or £60 from the NCC's book club.

More workspace

TO provide more space for Argus production, assembly, testing and software, and sales staff, Ferranti is taking over extra laboratory and office accommodation near its present plant at Simonsway, Wythenshawe, Manchester.

GILB'S MYTHOLOGY

Mecca method for comparing systems . . .

ONE of the management methods which consistently scores high among my course participants is the Mecca method. Mecca stands for Multi-Element Component Comparison and Analysis. Mecca is a technique for helping compare any two or more competitive alternatives. Mecca is not needed if the only comparison criterion is simple, say the price as an example. But it will be appreciated if the choice is complicated, and based on many variable qualities which must be considered at the same time. This situation is common in the computer business.

Thus Mecca was originally heavily used to help compare computer selection choices, and is now frequently used to help evaluate such questions as the best software package, the best operating system or the best database software.

The idea is not new. I have a letter 200 years old from Benjamin Franklin to Joseph Priestly which advised him to use a variant of the method to solve his decision-making problem. Ten years ago, I presented the method to the National Computing Centre, who years later reported to me that they had spread it widely in the UK for computer selection purposes. The usefulness of Mecca is first perceived by those who have had to struggle with the problem of evaluating our complex hardware and software systems. I should mention that it has other uses, and has been used to evaluate job candidates, organisational decentralisation, and atomic energy plant selection too.

In a very brief space, I shall sketch the method. Step 1: A list of the major quality criteria is made. If necessary a hierarchical (root like) breakdown can be made for detail.

Step 2: Percentage (of 100% of any group of quality criteria) weights are assigned to each quality area. These should ideally be in proportion to the long term economic impact of variation in the quality being weighted. In any case, the evaluation group and higher management should agree on the weightings.

Step 3: Facts are collected about all the qualities being evaluated. When most relevant data seems to be in hand, a relative score is given for each alternative design being evaluated, at the most elementary (detailed) level of the Mecca model.

The scoring system gives five points for "average" quality (within that group being evaluated) and down to zero in steps of one, or up to 10 (meaning as good as is interesting or useful).

Step 4: The weighted average score is computed up through the model hierarchy.

Step 5: Is to re-cycle, especially to Steps 3 and 4 above and try to provoke better fact collection, or even alteration of the facts (like a price discount by the second place alternative, or a better contract guarantee. All critical things are evaluated and contract guarantees are often among them).

We also try to provoke losers to explain why we have over-evaluated their competitors and under-evaluated their own offerings. This phase is often the most interesting and useful. At some point you stop due to schedule pressures or the fact that you sense that no further progress will be made.

This short description must necessarily leave out some of the rules and cautions for making the method work well. Though you can discover these for yourself by applying common sense and getting some personal experience with the method.

You might like to try it the next time you do a comparative evaluation. If nothing pops up in your professional work immediately, you might like the exercise of applying the method of evaluating cars, a marriage partner or your next employer.

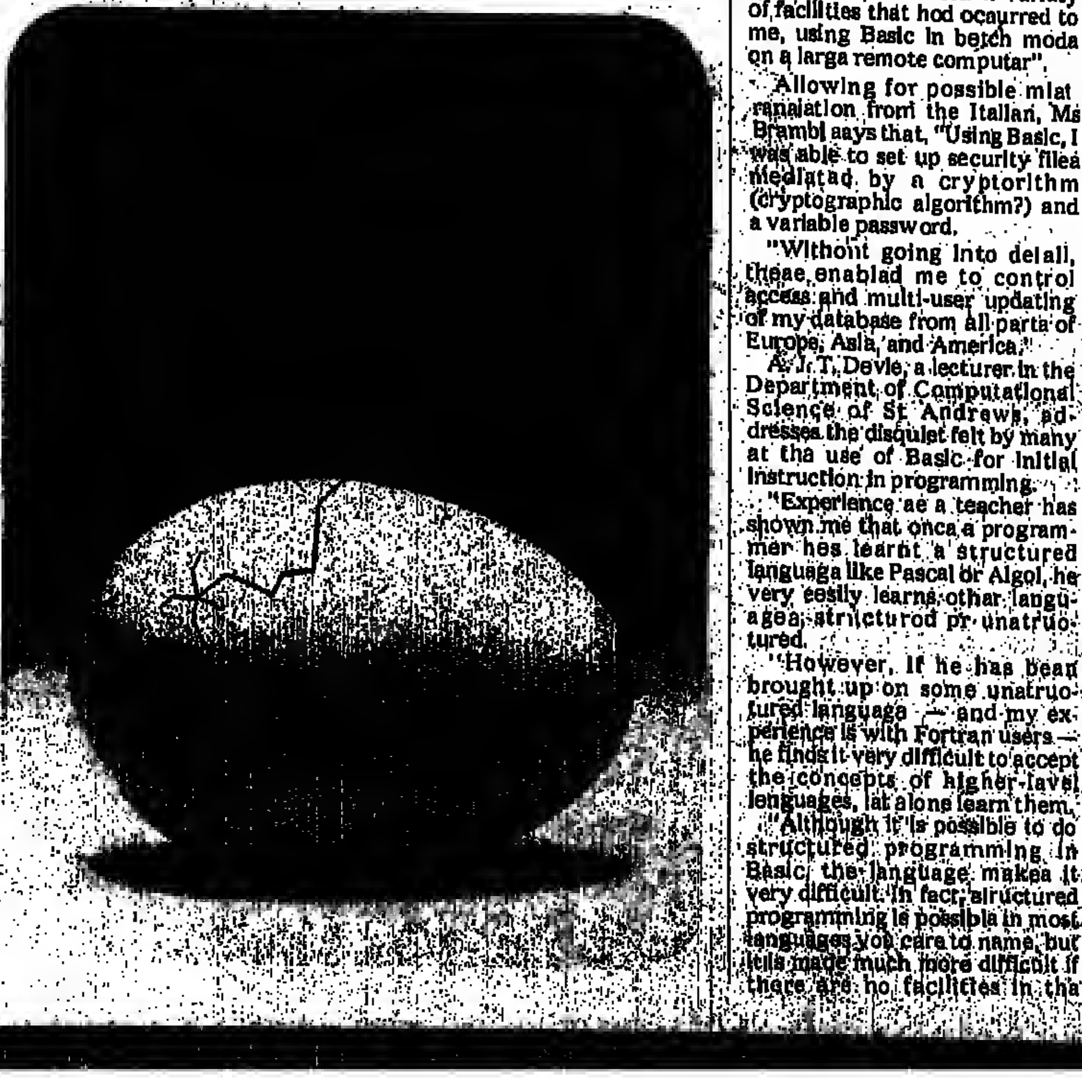
PROGRAMMER NOTES

Some Basic experiments

THE debate over the proper sphere of application for Basic remains lively.

Suggestions that the language could legitimately be applied to a wider range of applications (Programmer Notes, March 16) have stimulated at least one reader to experiment successfully with Basic for production jobs.

Meanwhile, a lecturer from the University of St Andrews has written to argue against the use of the language in teaching.



Anna Brambl, from Tremezzo in Italy, writes (in Italian) that "stimulated by the article, I quickly implemented a variety of facilities that had occurred to me, using Basic in batch mode on a large remote computer".

Allowing for possible mistranslation from the Italian, Ms Brambl says that, "Using Basic, I was able to set up security files mediated by a cryptorithm (cryptographic algorithm?) and a variable password.

"Without going into detail, these enabled me to control access and multi-user updating of my database from all parts of Europe, Asia, and America."

A. J. T. Devie, a lecturer in the Department of Computational Science of St Andrews, addresses the disquiet felt by many at the use of Basic for initial instruction in programming.

"Experience as a teacher has shown me that once a programmer has learnt a structured language like Pascal or Algol, he very easily learns other languages, structured or unstructured.

"However, if he has been brought up on some unstructured language — and my experience is with Fortran users — he finds it very difficult to accept the concepts of higher-level languages, let alone learn them.

"Although it is possible to do structured programming in Basic, the language makes it very difficult. In fact, structured programming is possible in most languages you care to name, but it is made much more difficult if there are no facilities in the language to help you.

"One thing to remember about structured programming is that it relies on the data being structured as well as the program. There is no facility in Basic for records and none for allowing structures to point at one another.

"When it comes to the actual program, this is difficult to structure also because the structured concepts ifs . . then . . else, and while . . do are not in the language. So it involves writing down your ideas in another way first (possibly in a structured programming language) and then hand translating them into Basic.

"The chief reason Basic is popular is that it is cheap to implement and cheap in the sense of paucity of its concepts. It is also cheap to get a programmer off the ground with it — because there is so little to learn. However, he will never learn to fly with it."

● One attempt to introduce control structures to Basic is the Strubal (Structured Basic Language) compiler produced for the Motorola 6800 microprocessor by Hamenway Associates of Boston, Mass. Programmer Notes would be interested to hear of UK experience with the software.

Puzzler

HERE is another of those very clever, "true" alphametics, where not only is the message valid, but the concealed addition sum also. See page 37 for the unique solution.

```
FOURTEEN
 FIFTEEN
   THREE
    NINE
     TEN+
FIFTYONE
```

SOFTWARE FILE-1

CA moves on SNA emulator pack

A COMMITMENT to IBM's Systems Network Architecture has been made by Computer Automation, which says that it will later this year provide SyFA users with an IBM 3790 emulation package based on SDLC line protocol.

The company has also announced screen management software for its SyFA systems and a new disc-based operating system for the Naked Mini 4 family of OEM minicomputers.

The new SDLC facility, which allows one or more SyFA systems to communicate with a 370 mainframe, uses a dedicated microprocessor as a front-end in conjunction with a software emulator executing in the SyFA's main memory.

It will support SNA communications initiated by any of the 24 terminals attachable to a SyFA system.

The SDLC Processor, priced at £4,500, and the SNA-3790 software, also priced at £4,500, further expand the range of SyFA communications facilities, which already includes emulators for 2780 and 3780 RJE and an interactive 3270 emulator.

Called Panel Manager, the new screen handling software allows the programmer to create terminal layouts interactively. The system also enables the user to define data input edit rules, which will be applied automatically by the software.

In its first release a single user development system, OS4 offers Naked Mini users facilities based on a real-time executive and file manager which will now be common across the hardware range.

Program development facilities include source and line editors, a macro assembler and linker, and a debugging module.

Currently supporting Fortran and Assembler, the system is expected to run Coral, Commercial Basic, Cobol and RTL/2 in the near future, according to a spokesman. Subsequent releases will also be fully re-entrant and multi-user, he added.

Further development of IC testing system behind takeover

THE further development of a software system for testing integrated circuit boards is cited by Teradyne Inc, of Boston, as the chief reason for its takeover of a software house based in Dallas, Texas.

The company, Digitast Corp, is the developer and owner of a program known as D-Lasar, which Teradyne makes available to its customers as P400 on University Computing Company's time sharing network.

By acquiring the assets of Digitest Corp, Teradyne will gain technical control over the future development of the software, said a spokesman.

P400 is said to be the only commercially available software that can automatically generate complete input test patterns to provide high fault coverage on complex IC circuit boards.

It may be used to generate test programs for any of the L100 series produced by Teradyne, which is a major manufacturer of circuit board testing systems.

SOFTWARE FILE -2

EDITED BY PETER HEWITT

Top Coral man for BCS talk

One of the leading proponents of Coral, Professor Michael Griffiths of Nancy University, France, will be the speaker at a meeting of the BCS specialist group concerned with formal aspects of computer science. The meeting is on Thursday, August 31, at the Polytechnic of Central London, at 6.30pm.

Professor Griffiths, whose talk is entitled Program Transformation, has been working on the development of languages similar to those involved in the US Defence Department Ironman project.

Details of US micro development tools

DETAILS have come to light of a very comprehensive range of microprocessor software development systems produced by a software house in Waltham, Massachusetts.

The systems, which are supported on a variety of Digital Equipment and Data General machines, are also available on several international time sharing services.

Developed by The Boston Systems Office Inc, the software includes cross-assemblers, linkage editors and simulator debuggers for most current microprocessors.

Devices supported include those manufactured by Advanced Micro Devices, AMI, Fairchild, Hitachi, Intel, Intersil, Mostek, Motorola, National Semiconductor, RCA, Rockwell, Synertek, Texas Instruments, Thomson-CSF and Zilog.

The tools, which are all written in the host computer's assembler, run on PDP-8, PDP-11, the DECsystem 10 and 20. Data General computers which can host the software include the Nova, SuperNova and Eclipse.

For the most widely used microprocessors, BSO in addition offers high-level language facilities. These include cross-compilers for Fortran IV and Pascal as well as Basic.

Features of the cross-assemblers include conditional assembly instructions and macro capabilities based on string replacement of arguments.

They also have the important ability for RAM/PROM segmenting, so that program and data sections can be directed to either random-access or read-only memory as appropriate.

Because they are written in assembler, the cross-assemblers and simulators offer major savings in CPU time over similar products implemented in high-level languages.

For example, the cross-assembler for the Intel 8080 has been shown to produce a reduction of 20 to 1 over Intel's own 8080 cross-assembler, written in Fortran. Other tests have shown a reduction of as much as 70 to 1.

The company, which is actively seeking an agent in the UK, declined to identify specific time sharing networks through which the software could be accessed in Europe.

Ansi moves on standard text processing language

A COMMITTEE sanctioned by the American National Standards Institute has begun work on the formulation of a standard end-user language for text processing. The committee, under the auspices of the Computer and Business Equipment Manufacturers' Association, aims to have a complete draft ready late in 1980 and an approved standard by early 1982.

The team, which comes under the jurisdiction of Ansi's X3J6 division, is also seeking to attain recognition as an ISO working group, according to the chairman, Charles Card of Univac.

The proposed standard will encompass both the syntax and the semantics of the language, according to Card. Its scope will include the definition, description, recording, recall, transformation, searching, manipulation and display of text.

A major overlap was inevitable with word-processing and computer graphics, noted Card. However it was not part of the committee's intention to standardise in these areas too.

Nonetheless the group had official procedures for liaison with Ansi's X4A12 committee, which was working on a standard alphabet and keyboard for word processing, and the two teams also shared a number of participants, he said.

The standard will include a section covering systems for information retrieval, which the recently formed UK group is also examining (CW, June 29).

Use of the language would by no means be restricted to computer professionals, noted Card, but would include predominantly secretaries and clerks. Such users, as well as those more experienced, found the differences between existing systems very difficult to work with.

The primary thrust for the standard had indeed come from the end-user community.

Some indication of the intended shape of the new language is provided by systems that the group has already studied. These include Honeywell's GCOS text editor, IBM's ATMS, QED from Bell Labs, MIT's expansion of QED-QEDX, NLS developed by the Stanford Research Institute, Wylbur, EDIT and others.

The new language would in one sense represent a superset of the facilities of such systems, said Card. He added that the level at which the standard was expected to operate could be compared with that of the machine tool standards established by APT.

Thus, implementers of word-processing systems might choose to use the new language directly, he observed, or could provide a suitable interface.

Similar considerations applied in the case of online retrieval systems, such as Lockheed's Dialog, where the committee was concerned only with the way in which a user made his reference.

In the case of computer graphics, the committee did not intend to deal with actual constructs, he noted, but it was expected that interchange mechanisms could be specified, which would be resolved by a post-processor.

The typical implementation environment could not be predicted with any certainty so far in advance, he said, but would almost certainly range from networks of microprocessors to large mainframes.

One problem that had already arisen related to the different character set requirements for text and word processing. The text processing language was to be based on the 96 character Ascii standard, Ansi X3.4-1977.

Requirements for word-processing systems were in general thought to be rather larger, he said, including for example foreign alphabets and scientific symbols. Conflict in this area had already taken place between the two groups.

The proceedings of the committee, which has met twice so far, will be in public and are likely to be published.

Ventek's IBM RJE emulator

A SINGLE software package capable of emulating several IBM RJE terminals has been released by Ventek for its Datapoint systems. The program, Multiple Terminal Operator, allows the operator to select either IBM 2780, Hasp, RES, or JES workstation emulation.

In a typical MTE implementation, said the company, the operator keys in data locally to update or create data files. When ready for transmission to the mainframe, the system displays to the user a menu of transmission options.

The operator can then select the appropriate emulation mode by a simple keyboard entry.

MTE operates on Datapoint 1130, 2200, 5500, and 6600 systems with at least 16K bytes of memory.

SPL opens research centre

A SOFTWARE research centre has been opened by SPL in Abingdon, Oxfordshire. An early project for the centre, to be staffed initially by 30 senior consultants from throughout the company, will be the implementation of a real time Pascal compiler.

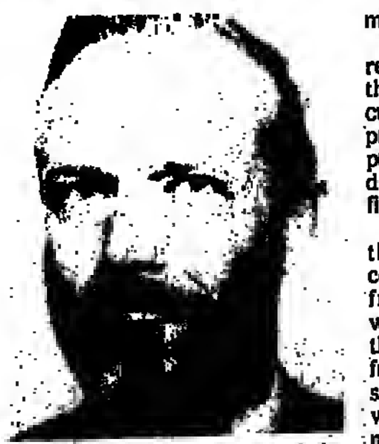
Intended to consolidate and expand the company's basic research activities, the centre will also begin work soon on various new projects.

Digital electronics CAD consortium to give its results to EEC in November

THE international consortium which has been studying the application of computer aided design to digital electronics for the EEC is to present its results at a conference in Brussels in November.

The consortium — led by Saget and including Plessey, Nixdorf, and Semo with Brunel University as consultants — began work last July (CW, July 21, 1977) and is due to conclude the £88,000 study in September.

Although the results are likely to be published eventually, the EEC-sponsored conference will be the first opportunity to assess the group's findings, which are based on a survey of 85 institutions in Europe, the US and Japan.



Layton . . . at presentation of the report.

According to the EEC, the symposium will focus particularly on the evolution of LSI technology and the areas of greatest potential opportunity to EEC member states.

Topics to be covered include product specification and synthesis; modelling and logic simulation; design for testability; layout; integrated CAD systems; custom LSI economics; and a comparison of CAD for LSI devices versus CAD for printed circuit board requirements.

In addition to presenting the results of the survey analysis, the symposium will include discussion of the state of the art in present technology, and identify problem areas and possible EEC development actions in this field.

Presentations from consortium team members will be complemented by contributions from invited speakers worldwide and EEC officials. Among the former are Professor Lewin from Brunel University, Professor Szygenda from Texas University and W. Lattin, CAD manager for Intel in the US.

The latter group includes Christopher Layton and S. Bir, the head of the EEC's DP Projects Bureau.

Reservations and requests for further information should be addressed to Keneas Belgium Congress SA, Rue de L'Industrie 17, 1040 Brussels, Belgium. Tel: (010 322) 230 0953. Telex B 62995.

High-level language for J100 Videocomputer

A HIGH-LEVEL user-oriented programming language has been introduced by Jacquard Systems for users of the J100 Videocomputer. Meanwhile Business Research Ltd, of London, has produced a range of commercial application packages which run on both J50 and J100 systems.

The new Jacquard language, known as Data-Rite, is intended particularly for handling distributed files and data entry applications. Typical applications cited by the company include order entry, stock monitoring, general office recording and mailing lists.

The package, which is supplied to users free of charge, consists of two main components: Data-Form for handling VDU formats and record layouts; and Data-Talk, a command language for handling input and output.

Data-Rite also supports information sharing in a network of J100s connected together or linked to a mainframe. In the latter role, it facilitates the offloading of mainframe jobs to a J100 in gradual steps, notes the company.

Packages available from the Business Research Nubus range cover sales order processing, invoicing, stock control, and purchasing functions as well as the sales, purchase, and nominal ledger accounting.

Also available are systems for budgeting and financial modelling, management accounting and product costing.

The software, which allows the user to design his own screen and report formats using parameters, can operate concurrently with standard Jacquard systems such as the word processing package Type-Rite IV.

هكذا من الأصل

OP SPOT **By Bernard Allen**

Barclays—how many will go to Gloucester?

BY next April, the two main London computer centres of Barclays Bank will have been relocated to a new site in Gloucester.

But new sites need operations staff, and how many of Barclays' employees are prepared to move in accordance with the plans?

The answer is still unknown because since the details of the move were made known, last October, there has been a steady flow of leavers from both the Harlesden and Tottenham Court Road centres. One source told me that the figure is about three per month.

It would appear that a considerable number of staff are none too keen about moving away from London.

However, a spokesman for the bank, although unable to give me the exact figure, said that it does not exceed the anticipated total. Apparently the bank would expect a 20 per cent wastage of operations staff in any one year.

Despite this, the bank is recruiting staff for the Gloucester centre. It is taking recruits from the Gloucester area and on a nationwide basis, in which case the new staff will be employed at the Harlesden site until next April.

The spokesman pointed out that refusal by staff members to be relocated is in direct contravention of their terms of employment.

Indeed, the staff handbook states that "Every member of staff must be willing to serve at any office of the bank as may be required."

More specifically, all staff over the age of 25, with the exception of those within two years of the retirement age, must be prepared to relocate.

And all negotiations with the National Union of Bank Employees, the staff's official representative body, are based on this premise.

Staff under the age of 25 have the choice of relocating to Gloucester or being placed in another position with Barclays in the London area. Should they favour the latter, it would mean moving out of computing.

The bank has offered the staff a number of incentives:

Firstly, a disturbance allowance, comprising a quarter of each employee's yearly salary. This is modified by having a minimum of £454 and a maximum of £931.

Those who move can claim a removal grant of up to £865 to cover incidentals such as the cost of decorating or soft furnishing, full coverage of removal expenses, covering such costs as the hire of a van and solicitor's fees, all expenses incurred in visiting the area of the centre with the intention of purchasing a house. The bank is also providing day trips to the area.

For those unwilling to make the move, the bank says that it is willing to compromise. It intends to implement a severance scheme under which staff may stay with the bank until the time of the move. Staff agreeable to this would receive between 13 and 39 weeks' pay, depending on length of service.

In past negotiations, the union has called for redundancy pay in place of the severance money. A vital point here is that the former is non-taxable while the latter is taxable.

In this regard, the bank points out that staff are not being made redundant. It emphasises that the jobs still exist, only in another place.

Talks are in progress between the union and the bank on the shift system employed at Harlesden and the matter of seven-day, 24-hour cover at Gloucester.

To facilitate the relocation, work and staff are being moved from the Tottenham Court Road site to the Harlesden centre. The shift pattern is a moot point because the former employs an eight-hour based system while the latter uses a 12-hour rota.

HINT OF THE WEEK

Make best use of macros to save time and effort

THE use of macros to save operators' time and effort is the basis of a hint sent in by Derek Hewer, a senior operator at the Colchester site of McCorquodale Books.

The machine is an ICL 2903, which does not have an operating system and instead runs under a Manual Exec. Great emphasis is thus placed upon the Job Description facility.

Says Hewer, "When running under Job Description, use the 'copies' option rather than printing on two or three part listing paper. In this way it is possible to get copies of the listing on one-part stationery and so avoid changing the printer too often."

As an example, he gives the following line of Job Description:

```
OUT    LP1    (XXXXX),    %B
<C2>,F0001
```

XXXXX represents the name to be assigned to the output listing %B<C2> instructs the system to produce two copies of the listing.

He goes on, "By using the dummy parameter in the macro [in this case %B] the number of copies produced may be altered as required. This is achieved by entering the required number on the Macro Call Card."

He concludes, "This, in itself, can be very helpful when there are several users of the same piece of job description, and each has a different copy requirement."

Essential skills for a shift supervisor

TECHNICAL knowledge, the ability to supervise staff and an awareness of the need for strict security — these are some of the requirements of a shift supervisor in a large bureau environment.

In fact, his role reflects the size and complexity of the system, the number of staff under his control and the business of the company that employs him.

These points stood out clearly after a talk with Dick Galazka, who fills such a position at the Oxford Circus site of BOC Datasolve.

The system is an IBM 370/158 dual processor with six Megabytes of storage. There are two CPUs, but at Datasolve they are used together as part of one powerful system.

Datasolve is a bureau, providing online customer services under CICS, TSO, IMS and RJE. In fact, about 95 per cent of the system workload comes via the teleprocessing network.

The customers are paying for a service, and expect to get value for their money. Work must be channelled through the system as quickly and efficiently as possible.

Thus, much of the technical side of his function is concerned with ensuring that the work schedule is adhered to and that the throughput is optimised.

"We have a work schedule which we keep to every day," says Galazka.

But there are occasions when he has to draw upon his technical expertise in a very different manner.

Now the reason for this is that the site provides back-up facilities for "A small number of users," according to John Robbins, who is data centre manager at the Oxford Circus site.

The back-up facility is planned so that each time it goes into operation, the other users will experience no drop in the standard of the service they get from the bureau.

All users of the back-up facility have a system which is geared to Datasolve's configuration.

Says Galazka, "They bring their own system packs which must be compatible with our system."

In the event of the service being required when his shift is on duty, Galazka will be involved in the process from the very beginning right through to its conclusion.

First there is the liaison with the customer who, for one reason or another, wishes to have some time on the machine. In this regard, skill in communication is needed.

His technical expertise is then called upon when he has to "split" the system into two separate 370/158s, one for use by the customer and the other to carry the normal workload.

Says Galazka, "How I share the resources of the system depends on the workload I have and on the requirements of the user. Of the six Megabytes of storage I might, for example, give one to the user and keep five for the work of the other users."

Basically, the procedure is as follows:

Firstly, he offlines all the peripherals which are to be dedicated to the user of the back-up facility.

Next he does likewise to one of the two CPUs.

Then he offlines as much storage as is appropriate to the situation.

This done, he allows the operators from the user's installation to operate the system.

These operators work under the direct supervision of Galazka. The site accommodates the magnetic tapes of a considerable number of its users and is fully aware of its responsibility in this regard.

But let's not forget Galazka's own team of operators. He has a shift of seven, comprising a shift leader, a senior operator, an operator, a junior operator, a trainee and, of course, himself.

Says Robbins, "It is entirely up to the shift supervisor to decide how his shift is organised and run."

This means that he is in full charge of the deployment of his staff, working out who should be employed on the peripherals end who should work the master console and for what length of time.

Any person in such a position must use his supervisory and organisational skill to ensure that he makes the best use of his staff's experience and ability, but at the same time give those of the lower grades the chance to do some of the more technical work involved in operations.


Galazka

Managers must help operators to advance their career paths

IF career paths for operations staff are to become a reality, we need a greater interest in the matter from operations managers, who must review their staff regularly and provide opportunities for both formal and practical training.

These are some of the views of Barry Johnson, the operations manager at Sperry Univac's West London site. He writes in response to an Op Spot which attempted to define some ways in which the careers of operations staff might progress.

He begins by referring directly to some of the points I made in that piece.

Says Johnson, "Over the past three years I have employed similar methods to those outlined in your article.

"As a result of this, only one operator has left during the past two years. Staff from the operations department have transferred into such areas as consultancy, engineering and systems analysis."

However, he believes that I should have placed greater emphasis on the fact that too many operations managers have considerable deficiencies in this sphere.

The [illegible] recommendations regarding the operations manager's interest in his staff were not taken far enough. In my experience, the appraisals made by operations managers are often too general," he insists.

According to Johnson, it is vital that staff appraisals are carried out on a regular basis, and he goes on to describe the procedure followed at his site.

"At our centre, the appraisals are carried out on a periodic basis by the shift leader concerned. It is a two-way affair, with each of the parties having the opportunity to point out the other's weaknesses. The resultant appraisal is then put before the manager for his approval."

His views on staff training are strong, and refreshingly honest:

"In general, the training of staff is geared to keeping the operator happy without playing any significant part in the operator's career."

Continuing in this vein, he says "Operators should be given a specified objective to be reached within a certain time. For staff to achieve this, training must be provided."

In my piece on career progression I referred to the "right attitude" from operations staff. He comments on this and takes it a step further to include operations management.

"It is not just a case of the operators taking the trouble to read manuals and ask questions. Management must be in a position to provide answers to those questions, and time to read those manuals.

"Managers and supervisors must encourage their operators to break away from solely monitoring the system. As a result of this, the staff's thirst for greater technical knowledge will increase."

Mileage granted

IN response to a claim by the National Union of Bank Employees, Lloyds Bank is to pay a mileage allowance to its shift workers who have to use their own transport in the absence of public transport.

Opcomm resumes

COVENTRY-BASED operations group, Opcomm, will end its summer break within the next three weeks. The likely venue for future meetings is the senior common room at Lanchester Poly in Coventry.

Operators often complain that nobody listens to their point of view. Well, Op Spot is listening and Bernard Allen would like to hear your opinions and ideas on all matters relating to computer operations.

Your letters should be sent to Op Spot, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU. Telephone calls are equally welcome and Bernard can be contacted directly on 01-261 8035.

Guide to computer budgeting

BUDGETING is the subject of the latest volume in the series, Current Aspects of Computer Technology, from Input Two-Nine. Largely of interest to DP managers, the book consists of articles written by a range of experts, mainly from consultancies and bureaux.

The first part of the book, entitled "Monitoring the Installation", discusses budgetary control of computer operations and planning of requirements. Represented among the authors are the accounting/consulting firms Arthur Anderson and Coopers and Lybrand.

The second part covers "Practical Alternatives", giving examples of various ways of saving money, such as using distributed computing, facilities management, ready-made packages and time sharing. Second-hand computers, COM, and independent maintenance are also among the options put forward.

Electronic mail study

AN exhaustive study on electronic mail, including descriptions of the current state of the art, economic analyses, and predictions for the future, has been produced by the Yankee Group, a consultancy based in Cambridge, Massachusetts.

For $475 a customer receives the basic 332-page report, plus four quarterly 85-page updates, covering three broad topics: Computer-based message systems, Facsimile and Communicating word processors. Each technology is explained in considerable detail with examples of its applications.

The business aims and prospects of the companies in the field are discussed, and specific predictions are made about future products.

Yankee Group is holding a symposium on electronic mail in New York on September 12 and 13. Among the speakers will be Walter Hinchman, former chief of the Common Carrier Bureau of the Federal Communications Commission.

Council moves to Honeywell

MOVING out of its conventional batch processing procedures and into real-time processing, East Lindsey District Council is to replace its four-year-old ICL 2903 with a Honeywell Series 60 Level 62 system.

The £143,000 Series 60 machine will be installed at the council's headquarters in Manby, Lincolnshire, next March, and will take on all the current applications run on the ICL 2903 and provide an online rating system throughout the district.

SDI'S GRASP

When the London Research Station of British Gas at Fulham, developed a simulation program for assessing the capacity of gas fields it was given a name which inadvertently resulted in a similar acronym to that of SDI's well-known GRASP operating system extension for DOS and DOS/VS. The British Gas program, Gas Reservoir Area Simulation Program, was one of the items shown when the station celebrated 50 years of research earlier this month (CW, August 3). British Gas has now agreed not to use the name GRASP and thus will in future be used only for SDI's product, for which it is a registered trade mark.

New trend in hobby shops

Microcomputer hobbyist shops are becoming quite commonplace on both sides of the Atlantic, but Digital Equipment in the US has started a completely new trend by opening a shop that sells commercial systems costing up to $25,000 (CW, August 17). Located at Manchester, New Hampshire, an area with many small businesses, the shop can provide customers with same day delivery if required.

DEC says that it will not turn personal computing enthusiasts away from the shop but doubts if many of them will turn up because the prices of the systems on sale start at $10,000.

Rural experiment in fibre optics communications

FIBRE optics will be the centre of a communications experiment to be run in a small rural town in Canada, which Canadian Communications Minister Jeanne Sauvé refers to as the "beginning of a technological revolution."

Elie, 60 kilometers from Winnipeg, population 350, will have several interactive computer links for services such as teleshopping and information retrieval, five or more TV channels, radio and single-party telephones provided through a fibre optics transmission system.

According to Sauvé fibre optics is particularly suitable as a rural communications medium because in a few years it may be cheaper to run a fibre link than a conventional telephone wire and the same link could support many other types of communication and could triple telecommunications revenue through fees for other services.

The large information carrying capacity of fibre optics, and the uses to which this capability can be put means that a much wider range of services could be made available.

Sauvé foresees these expanding in the information, education and entertainment areas to an extent limited only by the imagination.

Initial suggestions include veterinary and farm management information, consumer reports, games, and income tax help.

The idea should be well received in areas such as rural Canada where a third to a half of telephone subscribers say they are unhappy with the service, compared to only three per cent in town. Thirty per cent of rural subscribers share a line with more than three others.

The Canadian experiment originated with the Manitoba Telephone System and is supported by the Department of Communications and the Department of Industry, Trade and Commerce. Government agencies and private firms will be invited to provide experimental services to test subscriber reaction.

Canada is also experimenting in satellite broadcasting and Sauvé suggests that these government backed experiments will bolster both hardware and software sectors of Canada's communications industry and safeguard cultural independence.


SAUVE . . . beginning of a technological revolution.

Growing industry

FIBRE optics is a growing industry which is passing from the experimental to the full production stage. Many of the most exciting applications of the technology are in inter-city telecommunication lines, using lasers for wideband transmission, carrying many signals along one fibre.

But there is also a practical use for lower grade optical transmission as a noise immune alternative to coaxial cable in local data links between terminals and computers.

In the UK a growing number of companies are providing fibre optic equipment.

A fibre optic data link made by Rank Optics in Leeds sells for 39p a metre and has a bandwidth of 10 MHz for up to 500 metres. Stepped price reductions reach 15p a metre at quantities of 100,000 metres.

The cable comes either with LEDS mounted for use with a customer's own transmission equipment, or Rank supplies a transmitter for £49, receiver for £73.50 and a range of connectors and couplers for both analogue and digital communication.

Areas of application include military and process control systems, since fibre optic transmission provides immunity to electrical noise and ground loops and is virtually impossible to tap without detection.

Rank puts the world market for short-haul fibre optic communication systems at £400 million a year by 1997, with long-haul equipment bringing the total market to about £1,000 million.

Several more firms market similar products — Lee Green Precision Industries and Roditi are two small companies in the field — while larger firms are ITT, Plessey, Corning and Pilkington Perkin Elmer. Bolting-Lee and Hellermann produce connectors and BICC does cabling of fibres from Corning.

Published prices vary, often because of differences in thickness, quality, coating, sheathing and reinforcing. Some companies like ITT and Plessey do not publish prices, but will quote only for an individual order.

●In the US a new company, Canoga Data Systems of Canoga Park, California has been formed to make fibre optic equipment and it expects to market an RS 232C data link before the end of the year.

On the long-haul side, Nippon Telephone and Telegraph reports successful transmission at 32 Mbps for over 50 kilometers without a repeater.

BOC Datasolve upgrades to a V6

WITH the prime shift workload on its Amdahl 470/V5 at Sunbury-on-Thames having reached 85% of full capacity, BOC Datasolve has upgraded the system to a 470/V6.

BOC says that 11 to 13% of this increase has already been provided by doubling the size of the high speed buffer in the CPU from 16K to 32K.

According to BOC, the upgrade of the CPU from a V5 to a V6 took less than a day and involved the replacement of one multi-chip barrier and some rewiring. The overall system expansion will involve no increase in the total physical size of the configuration because the cabinets to accommodate the extra memory were installed when the V5 was originally put in.

BOC believes that the enhancement of the Amdahl system at Sunbury makes it more powerful than its dual IBM 370/158 configuration at Oxford Street. The two sites together provide BOC's remote access IBM services.

US limits losses from electronic cashiers

LEGISLATION has been passed by the US House of Representatives to limit to $50 the amount an individual account holder can lose in the event of fraudulent use of an electronic cash dispenser by, for instance, someone who has stolen the account holder's card.

The vote in the House was overwhelmingly in favour of the bill, but it must still be passed by the Senate, where similar legislation is now bogged down in committee.

Backers of the law claim that lack of liability limitation is hindering acceptance of "electronic cashiers" by the public.

The law also applies to such automatic services as direct debit and credit transfer. As well as commercial banks, it covers savings banks and "savings and loan institutions."

This will be the first federal law to impose limits on such liability, although some States and individual banks have adopted limits of their own.

Position of women at STC

IN a report to employees from STC, the company claims that the proportion of its supervisors who are women is four times the average for other engineering concerns employing more than 1,000 — 25% as against 5½%.

The figure for managers is 1% which, although low, compares favourably with the 0.6% industry average.

In all categories STC employs more women than average, and in clerical and office work women romp home with 71% compared with a 60% average.

Lamsac reports offers advice on word processing equipment

By Rory Johnston

COMPREHENSIVE advice on the selection and operation of word processing equipment is given in a report* published by the Local Authorities Management Services and Computer Committee.

Although aimed at typing services staff in local government, any organisation thinking of automating its typing could find the report a useful guide throught the bewildering maze of competing products and claims in this field.

A supplement to the report gives details of most of the word processors currently available, together with the addresses of their suppliers. Inevitably, as the field is changing so quickly, this list is already out of date, but it is designed to be updated by the user, using a blank form provided.

The main report describes at some length the different types of machine made and the features they provide. Unfortunately, the daunting problem of how to decide which features are really valuable and which are not is not gone into in much depth; a much more detailed analysis would be required for this.

The report takes a healthy, slightly sceptical attitude towards manufacturers' claims, however, and users emulating this will be part of the way towards getting to the bottom of the problem.

Advice is given on how to improve conventional typing services, and on how to decide whether word processors are really necessary. The planning of the organisational changes, training, etc, required is described, together with warnings on resistance on the part of typists and authors. Early consultation is prescribed to overcome this resistance, but it is perhaps too simplistic to assume that so long as you talk to people enough, they will agree with you.

For instance, the concern of typists that they may become just machine minders is mentioned, but there is no discussion of whether working a word processor gives more or less job satisfaction than "steam" typing.

Sadly, there is hardly any mention of phototypesetting direct from word processors, which is now becoming a possibility, and will be very useful. It will also involve enormous union problems, as it touches on the printing industry.

The authors have obviously gone the rounds of the manufacturers most assiduously, listened with care to what they say, and generally informed themselves fully about the business. Prospective WP users who have not had the chance to go into the market themselves in detail could do well to read what the Lamsac report has to say.

*Word Processing, 38 pages, with supplement, 98 pages, is available from Lamsac, 3 Buckingham Gate, London SW1E 6JH, price £4 plus 50p p&p.

PEOPLE

Belfast bureau to run 333 miles for charity

A MARATHON charity run organised by Independent Computer Services of Belfast will cross Ireland diagonally from the extreme north-east to the south-west, and will cover 333 miles, finishing at Cork on September 16.

ICS hopes to raise £5,000 from the run, to be divided between the Northern Ireland Association for Spina Bifida and Hydrocephalus, the Northern Ireland Leukaemia Research Fund, St Anne's Skin and Cancer Hospital, Dublin and the Ballintemple Spastic Clinic, Cork.

The runners, divided into three teams, will each run one or two 30-mile heats. Deputy managing director Nelson Millar will lead one of the teams, and every section of ICS' staff, including programmers, cleaners, managers and operators, will be represented.

Old Bushmills Distillery in Co Antrim and Three Stripe International in Co Cork, ICS' northernmost and southernmost customers, are the starting and finishing points of the run.

Donations will be welcomed, and should be addressed to: The Secretary, ICS Marathon Charity Run, c/o Independent Computer Services Ltd, Queen's Road, Belfast BT3 9DT.

Geoffrey Stearmon has been appointed marketing director of Feedback Instruments, and will continue as technical director. **Trevor Anderson** has been promoted from assistant development manager to development manager of Feedback.


Hughes


Hill

Stephen Hill, previously systems manager for Fine Fare, has become data systems controller for Ladbrokes holidays and hotels division.

Peter Clements, previously operations manager with On-Line Systems, has joined ADP Network Services as European operations manager.

Colin Hughes has joined Anderson Jacobson as financial controller and company secretary, after holding the same post with Computer and Systems Engineering.

Alex Park has joined STC as director financial controls. He has been retained as a consultant by Lonrho since March, when he gave up his job as chief executive of British Leyland.

Derek Newman, hitherto group controller of management services with Racal, has been appointed to the board of Racal Group Services as director of management services. This is a newly-created position.

Tony Woodiwiss, previously regional manager, government and public corporations division for Redifon Computers, has joined General Computer Systems as territory manager for the Eastern counties and North London.

John Thomas has left ICL Dataskil, where he was supervising factory trials of 2970, 2976 and 2980 systems, to become operations manager of Safe Computing's bureau services division.

National Management Game winning team from Shell receive a £1,000 cheque and subsidiary prizes from (right centre) Harold Lever, Chancellor of the Duchy of Lancaster, and (left centre) Fredy Fisher, editor of the Financial Times. The team is (left to right) Nigel Warner, Geoff Brown, Lech Zwierzynski, Steve Phillip and Gije Suile.

Harry Bradley of RCA has been appointed marketing and sales manager. Until recently he was technical services manager.

Gerry Ricks has joined CAP as computer resources manager. His last job was as managing director of a computer bureau in Bermuda.


John


Masters


Papworth


Caine

Derek Masters has been appointed area sales manager with DCC International. His last job was as sales engineer for MDS. **Corolyn John**, formerly software development manager of Leasco Software's minicomputer division, has joined DCC as a software consultant.

Dennis Papworth has become sales manager with Gamma Associates. Previously he was sales manager with Honeywell. Appointed sales consultants with Gamma are **Mike Caine** and **Keith Turner**. Caine was formerly northern region sales manager with Honeywell, and Turner was a senior sales consultant in the East Midlands with Honeywell NISD.

Shell winners of National Management Game

THE 1978 National Management Game was won by a team from Shell UK, whose "company" made a profit of £8.1 million. Second, third and fourth places in a close contest were held by teams from IBM, chartered accountants Thornton Baker, and again IBM.

The winning team will represent the UK in the international finals, the European management championship, which will be held in Stockholm on September 8-9.

The Game is sponsored in the UK by ICL, the Financial Times and the Institute of Chartered Accountants in England and Wales, in association with the Confederation of British Industry and the Institute of Directors.

The countries taking part at present, besides the UK, are Denmark, France, Germany, the Irish Republic and Sweden, but it is hoped that many more countries will join in next year.

All the participating countries use the Nimex program, which was originally developed by ICL for the UK Game.

Details of the 1979 Game can be obtained by telephoning 01-242 7806.

Redifon branch in East Anglia

AN office to service Norfolk, Suffolk and Cambridgeshire has been opened by Redifon Computers in Stowmarket. Ken Bowman, territory manager, will be in charge. The address is 37-39 Ipswich Street, Stowmarket, Suffolk IP14 1AH. Tel: (04492) 5294.

At Redifon's Crawley HQ, Andrew Roberts has joined as a product marketing specialist. His most recent job was that of sales executive with Olivetti. Phillip Warner, lately a salesman with Adler, has become territory manager for the South-East branch with Redifon, and will be based in Croydun.

Plessey director retires

A CAREER spent entirely in telecommunications has ended for John Ireland, who retired as director of trade relations and projects of Plessey Telecommunications International recently.

He gained an engineering degree from Imperial College in the 1930s and spent two years with STC before joining the Royal Corps of Signals in 1939.

During the war he attained the rank of Lieutenant-Colonel and in 1946 was awarded the MBE for the part he played as second-in-command of the Second Army Signals, in providing communications during the Normandy landings and the advance into occupied Europe.

After several years with the Post Office and Cable and Wireless, in 1953 he joined AT&E to lead the System Planning Group set up jointly with BICC.

In 1959 he became chief engineer, and when AT&E was acquired by Plessey, held both technical and marketing appointments within the company.


Ireland

Obituary

Eric Willis-Jones

THE death has occurred, at the age of 52, of Eric Willis-Jones, a member of the executive board of Thorn Electrical Industries and chairman of Thorn's industrial control engineering group.

He became head of the measurement, control and automation division after reorganisation of the Thorn Engineering Group in 1972, and was appointed to the executive board in 1973.

He was a past president of SIMA, a council member of BEAMA, CAMA and ECIF and a member of the executive committee of the EEF (London Association). He was currently serving on the NEDC Automation and Instrumentation Sector Working Party for the electronics industry.

DIARY

AUGUST 28-SEPTEMBER 1
Eighth Australian Computer Conference, Australian Computer Society. Canberra.

AUGUST 29
Jackson design technique, management tutorial. Marcus Bromberger. Dept of Computer Science, University of Strathclyde, Glasgow. 9.30. Details from the Continuing Education Office at the University, tel: 041-552 4400, ext 2132.

AUGUST 31
Program transformations. Prof M. Griffiths. BCS Formal Aspects of Computing Science Group. Polytechnic of Central London, New Cavendish Street, London W1. 18.30.

SEPTEMBER 4-8
Medical Informatics Europe, congress. European Federation for Medical Computing. Cambridge.

SEPTEMBER 6-8
Compcon Fall 78. IEEE Computer Society. Washington, DC.

SEPTEMBER 7
People in computing, seminar. National Computing Centre. Riccarton Campus, Heriot-Watt University. Edinburgh.

SEPTEMBER 11-12
Non-invasive cardiovascular measurements conference. NASA/Stanford University. Stanford, California.

SEPTEMBER 12
Computer programs for project control, seminar. Association of Project Managers. Waldorf Hotel, London WC2. 10.00. Details APM, 01-799 3182.

Computers and the unions. Clive Jenkins. BCS 1978 Lecture Series. London School of Economics, London WC2. 18.30.

How do we use it? — how to monitor and control the day to day running of the system. Albert Stacey. BCS Group for New or Potential Users. Royal Angus Hotel, Birmingham. 14.00.

SEPTEMBER 12-14
Computers in cardiology conference. IEEE/Stanford University etc. Stanford, California.

SEPTEMBER 13
Meeting, CMC Users' Association (CUMAC). ITT Ltd. Saxon Motel, Harlow, Essex. 10.30. Details: Maidenhead 29525.

SEPTEMBER 13-15
Very Large Databases, conference. IEEE Computer Society/ACM/SMIS. Berlin.

SEPTEMBER 18-22
Jackson design technique, workshop. Marcus Bromberger. Dept of Computer Science, University of Strathclyde, Glasgow. 9.30. Details from the Continuing Education Office at the University; tel: 041-552 4400, ext 2132.

SEPTEMBER 19
Getting cost control accepted, seminar. Association of Project Managers/Association of Cost Engineers. Belfry Hotel, Manchester. Details: M. H. Drake, 061-228 2011.

Talk, Prof P. Samal. BCS Reading branch. Copper Inn, Pangbourne, Berks. 20.00.

SEPTEMBER 19-21
CAD/CAM, computer-aided design and manufacturing conference and exhibition. Computer and Automated Systems Association. Los Angeles.

SEPTEMBER 20
VME/K subgroup meeting. 2900 User Group. National Liberal Club, London SW1. 10.30.

SEPTEMBER 21-23
Symposium on interactive techniques in computer-aided design. IEEE Computer Society. Bologna, Italy.

SEPTEMBER 26-29
International computer communication conference, ICCC 78. International Council for Computer Communication. Kyoto, Japan.

SEPTEMBER 27
Intelligent terminals in information retrieval. BCS Information Retrieval Group. London.

Pay is the key to DP staff shortages

—SAYS LOCK GROUP SURVEY

FOLLOWING a rapid rise, there seems to have been "something of a brake" on salaries of DP personnel, according to the latest bi-annual salaries survey carried out by the Lock Management Personnel Group, of Guildford.

The survey, which covers the south and south-east of England (excluding central London) says that salaries increased in the 18 month period under review between 13% and 20% for most jobs with the more senior people receiving a higher percentage "and exceptionally, the median salary of management services managers has gone up 38%."

A further observation is that "it appears companies are prepared to run their departments under strength rather than risk disrupting their salary structure."

The salary of the average analyst, programmer or operator has failed to keep pace with inflation, says the survey, and "until some relaxation (in pay restraints) occurs there will continue to be many unfilled vacancies."

Actual salary figures for the various DP job descriptions are based on data collected during March and April and are an amalgam of information provided by over 50 companies and the records of candidates registering with Lock Management Personnel Group regional offices.

At the bottom end of the programmer section, a trainee programmer aged 17-30 was earning between £2,250 to £3,250 while at the top, a systems programmer aged 20-35 was at £5,500 to £8,100.

An analyst/programmer (22-34) earned between £4,500 and £5,900 and a senior systems analyst (26-37) between £5,500 and £7,200.

In the management positions, a project leader (25-42) was earning between £4,500 and £7,500 and the most senior person, the management services manager (30-52) could command between £7,500 and £12,000.

For operations and data preparation staff the pay scales were much lower, as shown by the £2,450 to £3,550 salary range for production/data control staff (18-30) and the £3,100 to £5,300 range for a data preparation supervisor (21-50).

A trainee operator (17-23) could expect between £1,950 and £3,250 and a shift leader (20-31) between £3,600 and £4,800.

The bottom end of management positions in this field, the chief operator, had a range of £3,450 to £5,300 while at the top the operations manager/controller (23-50) earned between £4,700 and £8,160.

In addition to computer personnel, the survey looks at accountants, company secretaries, personnel management, sales and marketing, manufacturing management, design management, and administration, clerical and secretarial staff.

NEWS IN BRIEF

Survey of DBMS users

A SURVEY of users' DBMS experience in the UK and Europe is to be conducted by the Butler Cox Foundation, the research association of Butler Cox & Partners. Based on a brief questionnaire with only eight questions, the survey aims to measure the success of DBMS implementation and the overall degree of user satisfaction.

Results are to be tabulated according to the DBMS product used. Questionnaires are currently being mailed to about 300 companies in the UK and Europe and firms wishing to ensure that they are included have been invited to contact Butler Cox & Partners.

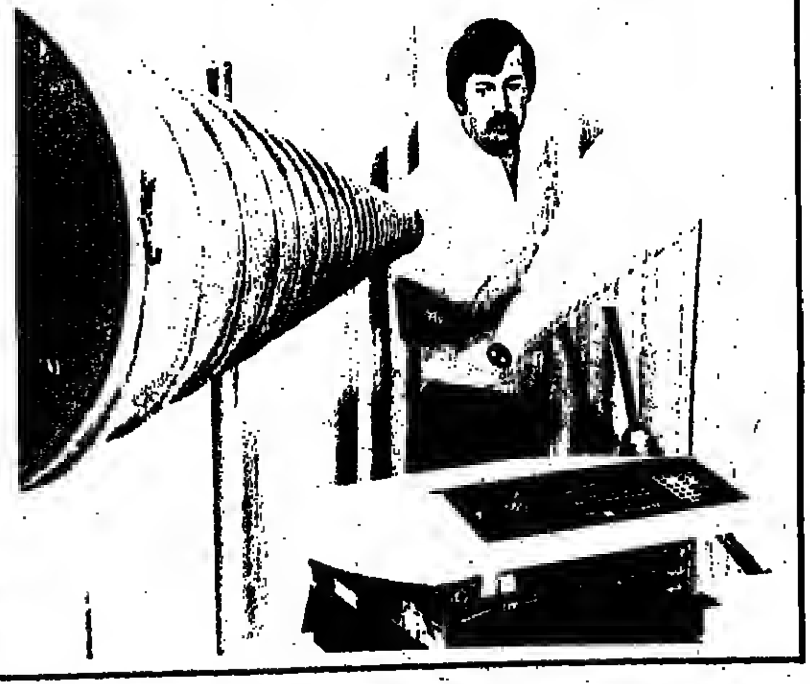
Refurbishing

DISC drives and storage modules from most of the well known manufacturers can be refurbished and upgraded by Sintrom Ellinor of Reading, the UK representative of the US-based refurbishing specialist, Trans Datacorp. Sintrom says that damaged or worn heads and spindles can be refurbished at between 30 and 50% of the cost of new parts.

Systime system

REPLACING a combination of bureau services and accounting machines, Needlers, the Hull-based confectionery manufacturer, has installed a Systime Series 3000 system worth £40,000. It will handle order processing, sales, purchase ledger and nominal ledger applications for the company, which has a customer list of over 14,000.

Bugs in the system



These conical logarithmic spiral antennas are used to test the effectiveness of shields against radio interference. Originally developed for the military, they are seen here being used by Richard Hatz with a Honeywell Level 6 minicomputer at Honeywell's plant in Billerica, Massachusetts. The company also uses them with terminals, printers and mainframe components.

Word processing conference dates

ANOTHER conference on word processing will be held at the Regent Centre Hotel, London, on October 30 and 31. Organised by Information Studies, the meeting will be called "Word Processing — the Human Dimension" and will be aimed at current and potential managers of word processing systems, discussing the selection and use of equipment.

Several pundits well known from other conferences will speak, including ergonomist Tom Stewart from Loughborough University, and Pat Coen from Logica. Norah Berckley of BSI, Shirley Pickard of ICI, and Doris Lenson, formerly of the AA, will give first-hand experience of the introduction of WP in their organisations.

A newcomer to the WP scene will be union man Barrie Sherman, research director of ASTMS, who has gained a reputation in the computer world for forthright and intelligent views on labour matters. He will talk about office automation and the unions.

Over the two days of the conference there will be round table discussions in addition to the formal sessions, to enable participants to air their own views and problems. They will be asked to complete a questionnaire before the conference to make clear their needs and expectations.

Attendance costs £225 plus VAT. Further information from Information Studies on Chorleywood (09278) 4244.

Secretaries opt for Data General

SUBSCRIPTION accounting and management information for the Institute of Chartered Secretaries and Administrators will be provided by a Data General Nova 3D computer and Data Logic software.

The £140,000 turnkey contract awarded to Data Logic follows a feasibility study by Cambridge Data Processing on the computer handling of records and bulk mailings for 30,000 members and 17,600 students. The previous system involved manual record keeping, Addressograph labelling and batch processing of subscriptions by a bureau.

CDC chief condemns 'predatory' takeovers


NORRIS

A NEW legal framework which would make it more difficult for contested takeover bids to succeed is being considered by a US Senate sub-committee.

William Norris, head of Control Data Corp, told the sub-committee that the capture of a firm by a richer one reduces employment levels, destroys job-creating resources and disrupts employee careers.

He suggested that shareholders in predatory companies should be required by law to vote on contested takeover bids. A social impact analysis of each takeover should be made before the acquisition was made, and a copy should be provided to any shareholder who requested it.

Earlier this year, Control Data shareholders agreed to an amendment in the company's articles of association designed to make it harder for CDC to be taken over (CW, May 18).

Canadian bureaux fear competition from the banks

CANADIAN computer bureaux are worried that proposed legislation there would allow banks to compete with them in providing data processing services. Proposed changes to the Bank Act are not specific enough in their stipulations, claims Derek Price, president of the Canadian Association of Data Processing Service Organisations.

Amendments to the Act as at present put forward state that banks may provide "banking-related data processing services".

Price wants the law to list specifically the services allowed, such as "the classification of deposits and payments, pre-authorised debits and credits, payroll preparation plans, and data processing in connection with a factoring service".

This would be in line with a White Paper issued in August 1976 which expressed concern about possible unfair competition, concentration of economic power, and conflict of interest.

Adapso in the US is also concerned about competition from banks, and is suing a New York bank in a test case (CW, July 7).

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MICRO NEWS

Edited by Martin Banks

Computer shop to open in Luton

THE first week in September is the target opening date for a new personal computer shop for the northern home counties market. Though a lease has still to be signed on premises, the new shop, Isherwoods, based in Luton, will be selling a wide range of hardware from Commodore's Pet, up through the Apple II to the Sol and Cromemco systems, distributed in the UK by Comart.

Leading lights behind Isherwoods are Bob Crook, an ex-advertising executive who currently has his own company, RIIC, selling programmable calculators and cost estimating packages to the printing industry, and Robin Woods who, until recently was personal computer product manager in UK for Texas Instruments, and now has formed his own company, Robin Woods Personal Computer Consultants.

Crook and Woods have also formed a joint company, RIIC Business Systems, which will trade under the name Isherwoods.

In addition to the hardware, which will range in price from the Pet at £695, through to systems costing around £10,000, Isherwoods will have a strong bias towards the development of packaged software for business and professional applications. Crook indicated that several software consultants were currently working on specific projects, such as stock control and payroll packages, and said that the objective was to have them available off the shelf, and at low cost.

Despite this bias, the shop will be selling equipment right across the market spectrum, including the hobbyist and home user. Stocking orders have already been placed with Commodore, for the Pet, Personal Computers for the Apple, Comart for the Sol, also for North Star and Cromemco lines.

Texas: Three markets

AS the ex-product marketing manager of personal computers for Texas Instruments, Robin Woods has an intimate knowledge of the company's thinking in this area, and is keen to see the planned systems being sold through the new shop.

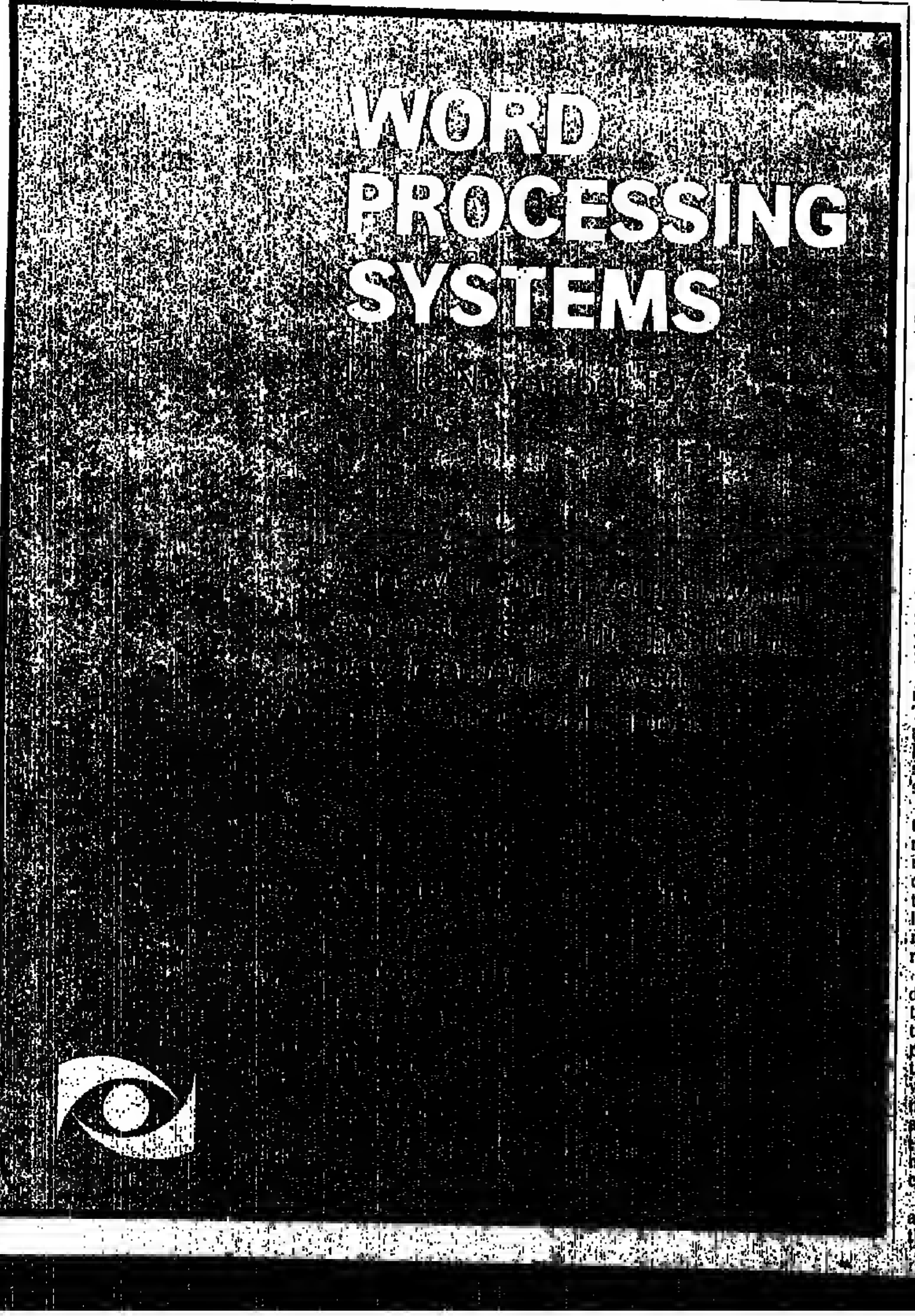
According to Woods, the projected TI range of hardware is due to be launched, at the latest, by the end of this year, with autumn the most likely time.

From a variety of published data from the company, he says, it is possible to deduce that three distinct markets have been identified, and that the company is probably planning to introduce different machines in each sector.

The first is the professional market, which is seen as requiring flexible programming and a high order of computational ability.

The second market is the small commercial business system. Here, the computational requirements are low, but the system will require excellent operating software to handle large databases with ease.

The third market sector is the home, and according to Woods, TI's thinking here is for a $200 to $500 system suitable for such applications as domestic cash flow, tax planning, and insurance inventories.



Mostek set to market 32K hybrid RAMs

FOLLOWING the move by IBM to buy 4K static RAMs from Intel (CW, July 13), and the conjecture that the same would soon be happening in 16K dynamic devices, with two chips mounted together to form a 32K hybrid, one of the contenders for this upcoming IBM order is now set to launch the product on the open market.

That contender is Mostek, which according to US sources, has already lost out in the IBM race to Intel and Texas Instruments, so the company now plans to sell its hybrid memory.

Dietrich Erdmann, European vice-president of Mostek, confirmed last week that the memory has been produced, but said that there are no sales or marketing plans for it, and no pricing structure as yet. There are indications, however, that it is already being mentioned to some European customers.

The device itself consists of two 16K dynamic RAM chips mounted side by side in an 18-pin dual-in-line package.

This design was hoped to meet IBM's requirement for "doubled-up" hybrid memory packages, and followed a pattern set by Mostek last year, with a side-by-side configuration using 4K devices. This was originally developed to meet a specific customer requirement, and was later made available on the open market.

IBM, which favours such hybrid constructions, already uses 2K devices of its own manufacture in packages that contain 4 chips, giving an 8K RAM.

Both Intel and Texas Instruments have gone for the alternative solution of stacking the 16K chips, one on top of the other in an 18-pin package. This is favoured by IBM, and has been christened the IBM "Love bug" by the industry.

At first sight, this move by Mostek seems a little strange, for several reasons. First and foremost, it puts the company in a somewhat isolated position in the market, in that it seems to be the only memory maker prepared to introduce a 32K bit part.

The second important consideration is that, historically, memory components with capacities that are not even number powers of two have never been successful. The 32K part (32,768 bits) is 2^{15}.

This is borne out by the relative failure in the market of 512-bit, 2K and 8K RAMS, as opposed to the 1K, 4K and 16K

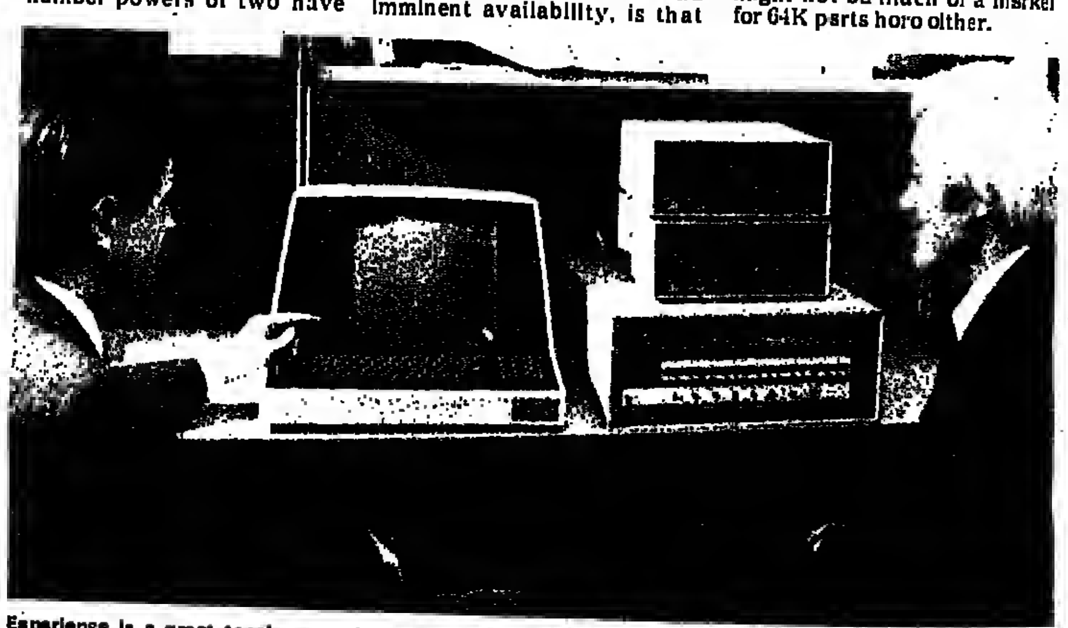
On the plus side, however, is the fact that even though IBM has chosen the 32K size only for internal use, it is big enough to make it a de facto standard.

On top of this is that by using existing devices, albeit in a non-standard package, Mostek will provide an effective means of increasing memory capacity at low cost. And unlike IBM's 2K/8K configuration, which did not take off in the marketplace, this new memory could well do so. If only because IBM is obliged to buy the devices on the open market, rather than manufacture them internally.

One final factor in its favour, a point related to its low cost and imminent availability, is that there are hints of doubts appearing about the market prospects for a memory as big as 64K, a subject now close to the heart of the UK government.

With the majority of microprocessor devices and applications to be found outside the DP industry, it is interesting to note that a market survey, attributed to National Semiconductor, suggests that the average read/write memory requirement in such applications is 128 bytes. From this it is possible to see that a 64K RAM would be something of an overkill, and during its early days, an expensive one at that.

If IBM, still "the" computer manufacturer, favours 32K as a memory size, it is possible that many of its competitors may start feeling the same way. Should that happen, then there might not be much of a market for 64K parts here either.



Experience is a great teacher, as the staff at SIS Applied Systems are finding out. This Altair 8800b system, pictured above, which is used for basic research, as well as demonstrations on public courses run by the company, is also being used by the SIS staff as a tool for self-learning.

The aim, according to SIS director Garfield Collins, is to help the staff assess the place of the micro in business organisations. One particular area where this learning is being applied is in distributed intelligence.

SIS has developed a pre-processor to produce a source program from keywords in the SIS structured programming design language. From this, the pre-processor can produce a compact Basic object code, which the Altair's Basic interpreter executes at run time.

Now Intel plans its assault on the next 10 years

WITH 10 years of operation behind it, Intel is now gearing itself for an assault on the next 10 years of development in microelectronics.

Speaking last week at an anniversary luncheon in London, Tom Lawrence, vice president and director of operations for Intel in Europe, pointed to several areas where, he thought, such innovation would come.

While declining to confirm that his thoughts were representative of committed research programmes within the company, Lawrence suggested that one of the next big developments would be in dynamic reprogrammable architecture in microcomputing.

This, he felt, would involve the development of microprocessors that would adapt their architecture to suit the particular task required to be performed. Where this would be most relevant would be in dispersed multiple microcomputer systems, an approach to computer construction that could supersede the mainframe computer, as it is currently conceived.

Such microprogrammed adaptive control would allow this type of system to reconfigure itself to the needs of the task at hand. If, for example, the task called for a single 32-bit "number cruncher" then the system would configure itself as such a machine. If the next task required several 8-bit machines, preferably working in parallel, then that is what the machine would become.

The company also sees considerable importance in the future potential of the telephone and television as input/out tools.

While keen to maintain its position of market leadership in the microprocessor business, Lawrence indicated Intel's awareness of the change in market and product emphasis that the next 10 years will bring.

The company's first 10 years had been largely in the replacement products market, with dynamic random access memory replacing core, and microprocessors replacing random logic devices. While future sales in these areas would continue strongly, future product developments would be innovations and, therefore, without such easily definable market potential.

Ulster puts £75,000 into micro firm

FOLLOWING the lead set by the Department of Industry and the National Enterprise Board in funding advanced technology microelectronics, the Northern Ireland Development Agency has also got into the act with the provision of £75,000 for a new company, Power Automation Products, to manufacture a microcomputer system.

The company has already been operating in Canada for a while, with a Northern Ireland local man, John Cunningham, at its head. It has acted as a marketing company for the system, which has been developed and manufactured by a Lisburn-based company, Medical and Scientific Computer Services.

The plan is now for PAP to take over manufacture with Development Agency backing, a move that should create initially about 25 new jobs in the area.

The system itself is essentially a sophisticated monitor for public utility power transmission systems. Based on a Motorola 6800, it monitors the power lines and when a fault is detected, stores for later analysis the wave form of the transmission prior to, and immediately after, the fault occurs.

It has already been sold on the North American market, and PAP plans to expand sales into South America and Europe.

PERSONAL COMPUTING

To some extent, the Personal Computer has become the most accessible guise for the population to latch on to the microprocessor. In as much as any member of the public can understand the workings of computers, it is easiest for them to relate to the importance of the decreasing size of computing capability through a small, desk top system that can claim to be a "real" computer.

But even so, there are misconceptions. Usually, personal computing equipment is referred to as hobbyist, with all the connotations of midnight soldering by wild-haired "professors." Certainly, some of the personal computing equipment that is now available on the market falls squarely into that category, but much of it does not.

This widens considerably the size and scope of the market for such equipment, both now and into the future. Yet because the market, and the industry making and selling the equipment, is still relatively new, little has yet been discovered about its size and scope.

Applications that range well beyond the home and hobbyist

By Martin Banks

THE fact that new companies in the personal computing field are being formed almost weekly is sufficient evidence on the surface that a market for such equipment exists in this country. The size, scope and major sectors of that market, however, have been harder to isolate and quantify in the past.

That is why a small survey of the industry was undertaken, to try and establish some basic facts and figures. The survey was undertaken on the basis of the industry's own views of the market and its movements.

The most important fact to be established, silly as it may seem, was that the market for personal computer hardware existed at all. Even so, at a total estimated value of £5.5 million this year, it is by no means large.

The industry that makes and sells the equipment however, is confident of the future, for in two years time a growth of 682% in the market is predicted, bringing it up to £37.5 million.

Personal computers are already finding a wide range of applications that range well beyond the home and the hobbyist, so five main sectors were selected to point to the main areas where the equipment is used.

The first was the hobbyist/home user market; this was followed by the industrial/scientific market, the business/professional market, education, and other — a catch penny for the many esoteric applications that are being tried at present.

As the industry is still young, it was to be expected that the opinions of the industry would vary considerably. That this was so can be seen from the survey charts.

The divergence of opinion was more marked for the current year than in predictions for 1980, the second year of the survey. This is not surprising in view of the fact that, as a very new industry, it has precious little time to look beyond the immediate struggle to establish its individual operations. They all however, have a more considered view on the future and its prospects, otherwise they would not have entered the business.

For the 1978 total market, the average of the estimates given was, as stated, £5.5 million. The variance between the different answers, however, was particularly marked. They ranged at the lowest from £1 million, to "at least" £10 million at the highest.

By 1980, the average total market is expected to rise to £37.5 million. Here, the variance was smaller, ranging from £20 million at the lowest, to £50 million at the top end. Though relatively closer in opinion about 1980, it was noticeable that the market was still being guessed at, and many respondents prefaced their estimates with such statements as "probably at least . . ."

Despite what might appear to be a respectable rate of growth for a new industry, several companies expressed the opinion that the market was being extraordinarily slow to take off.

This was put down to be the fault of both the sellers, in terms of pricing and approach to the market, and the perhaps natural reticence of the potential buyers in purchasing new equipment.

But even if some of the industry thinks this growth rate is slow, it is undoubtedly a rate that will cause considerable problems for many of the companies operating in the business.

There will be many organisational problems to be overcome to keep pace with the market, and as the numbers increase of users with no previous electronics or computer experience, the total cost of "servicing" those customers will grow in importance.

This will come as education as part of the sales cost, and in back-up service and maintenance.

Even if this is maintenance by replacement, it will be expensive, and it is possible to predict that some of the current companies in the field, both selling and manufacturing, will drop by the wayside by 1980.

Of the five selected areas, the largest is the business/professional sector both for this year and 1980. This is followed by education, industrial hobbyist/home user, and "other" sectors (see Figures 1 and 2).

This year, the average percentage share of the personal computer market taken up by business/professional applications is estimated by the industry at 35%, or nearly £2 million.

Opinions varied within the sample, ranging from 20% to 55%, but the majority plumped for something over 30% for this sector. It is interesting to point out that the respondent that suggested a 20% market share for business applications, also suggested a total market of £10 million, still giving a value for the sector of £2 million.

By 1980, the sample predicts that the business/professional sector will take an even bigger slice of the greatly expanding market. The average estimate is 40.5% of the total market, with the variance ranging from 30% to 60%. In value terms, this is a range between £11.25 and £22.5 million.

Education, the next biggest sector, has an average estimated share of 23.66% for the current year. There was perhaps the biggest difference in opinion for this sector, which could partly be accounted for by different companies individual success (or lack of it) in selling to educational authorities and partly by different regional attitudes to computing and computing equipment among the educational authorities. The lowest figure for the sector was 2%, while the highest was 35%.

To some extent the inevitable delays by educational authorities in placing any orders for such equipment has been a hindrance on the potential of this sector.

As one industry member put it "if teachers had their own way, the educational sector could take well over £1 million this year". At 35% share however, other opinions indicated that they felt it would take that anyway.

As the decisions by educational authorities are made over the next two years, this sector could acquire a total value of around £9 million. The average estimated percentage share for education in 1980 will basically remain steady, dipping only slightly to 23.33% of the total market.

Again, the difference of opinion is marked, with the lowest estimate for the sector being 10%, under £4 million, while the highest was 40%, almost equal to the business/professional market.

One of the biggest surprises was the strength seen for the industrial/scientific market for personal computers. While much has been written about the impact of the microprocessor in the industrial field, this has generally been expected to be in the form of dedicated systems designed for particular applications, such as machine and process control.

While that may be the long term future for the sector, it is currently absorbing a reasonable slice of the total personal computer output in this country.

Several companies within the sample expressed surprise at the existence of this sector in the market, and were exploiting it with glee.

For many, it is a sector that was not considered viable, until it started making approaches to the industry.

Commodore, for example, chose to use the IEEE-488 standard interface with its Pet system, rather than S-100 or any other interface. This standard interface is however, the one used by electronic instrument manufacturers to connect different instruments together.

Such instruments, connected to a computer system, produce an automatic test system that can be changed to suit different requirements by changing the instruments used in the test procedure, and the computer program controlling them. By choosing this interface, the Pet can be used in place of the previous minicomputer hardware directly.

This is just one of the many examples of the use of personal computers in an area that would not normally be considered as a prime market.

This year, the average estimate of the percentage share of the total market taken up by the industrial/scientific sector is 21.83% — around £1.2 million — while the spread of opinion ranged from 10% to 35%. All companies within the sample, found this sector very visible.

By 1980, the sector is still going to be an important part of the market, with the average

● Turn to page 14

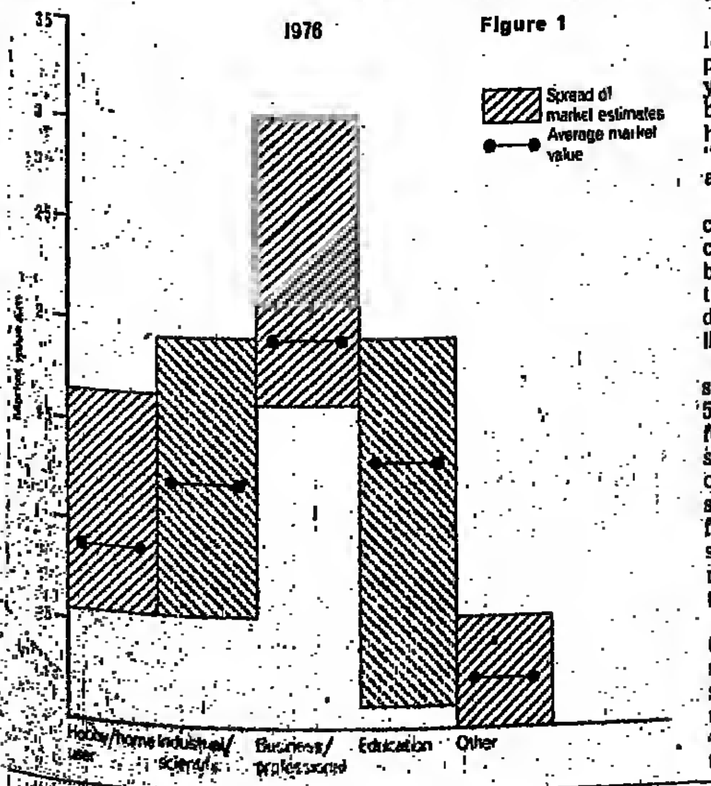


Figure 1

Figure 2

Low-cost packages the key

The Apple II computer, seen here working in an inventory application, is now to be manufactured under licence in the UK by ITT, the US giant that recently started a marketing operation on the system. The existing industry suggests that within two years, there could be a big "name" company emerging through the others in the market.

THIS, to some extent, is survey of the personal computer business in the UK — Part Two, for as part of the questioning of the industry sample that resulted in the marketing statistics that appear overleaf, questions were posed about the future, and the product developments that were felt most likely to appear.

While there were several different ideas about what might happen in terms of system hardware, the samples were of one accord when it came to software.

Within the next two years, in their opinion, there will develop a tremendous market for packaged software that should be both inexpensive and easy to use, and that enormous potential exists for a new group of entrepreneurs to come into the business to write this software.

Although there were degrees of opinion within this consensus view, every manufacturer and supplier of personal computer equipment contacted, predicted that packages software would be a market of tremendous value, and several indicated that it would probably be one of the key factors in the development and growth of the total market.

The prime reason behind this thinking is that the current market consists mainly of customers that have some knowledge of computers and computing, either directly or through some indirect contact like a relative or friend who has some experience.

There is, however, a very definite limit to the number of people in the country that currently fall into that category and there is, therefore, a potential limit to the growth of the total market.

By and large, the present market customers have sufficient skill to solve their own programming problems, though this may well be assisted by help through one of the many user groups and clubs that are springing up.

For those without the necessary experience, the only solution to the problems of developing suitable software to complete a system, especially where such software is required in a business or other productive application, is to go to a software or systems house and have the programs written specially.

This will usually achieve the objective extremely well, but the cost can be prohibitive, more than doubling the purchase price of even the most expensive personal computers, in many cases.

While this can be justified by the bigger businesses on a number of grounds, ranging from a sizeable saving in alternative operating costs, to the development of systems for long term future use in several business areas, the vast majority of potential users cannot stretch their resources to cover such investments.

This is why the personal computer business feels that the potential for inexperienced packaged software is so big. According to some statistics, there are around 1.5 million small businesses in the UK, and even a mere 10% of that still represents a sizeable potential market for both hardware and software systems, if it can be tapped.

So what does the industry feel is required? The first consideration that the majority mentioned was cost. The upper limit on the price of individual applications programs was £25, and some said a figure lower.

Each program should contain the basic structure necessary to perform the task required of it, for example a payroll package for up to 25 employees, but several companies suggested that there might well be a requirement for some individual tailoring of the standard package to suit the particular requirements of each individual customer.

Such tailoring, however, would need to be limited in scope, and should not cost much more than £10, and certainly not more than the cost of the original basic package.

Not only will these packages have to be cheap, but they will also have to be easy to use. This is not so much in relation to the medium used to carry the package. There is already a wide selection, ranging from paper tape to dual-density double-sided floppy discs to choose from, and each has its advantages and disadvantages. It is more to do with the fact that the new generation of personal computer users will not know, and will not want to know, about the intricacies of computer systems and programs.

The need will be for program packages that are loaded reliably with the proverbial "touch of a button," and subsequently do the required task, not so much efficiently, but with the minimum of fuss.

In relation to program efficiency, the majority of the sample seemed to feel that Basic would remain the top language of personal computing, despite the growth of Cobol, Fortran and Pascal in forms suitable for micro-based equipment.

Some felt that the market was becoming overskilled with new languages already, and pointed to the fact that Basic was now well established in personal computing. As each user can usually have a one-to-one relationship with a computer system at this level, the fact that Basic is an inefficient language was of little relevance.

Within all this euphoria, however, there lies the realisation that such potentially explosive growth in a new market for software products will almost inevitably attract some "cowboys."

Several companies within the industry said that there is already a need for some form of standardisation to be laid down if software packages are to be truly useful in developing the market.

One factor that was interesting to note was that none of the survey sample, even with some prompting, thought that firmware packages would make any significant impact during the next two years.

Firmware, software mounted in read-only memories, is not new as such, for nearly every microprocessor has an attendent Monitor program in ROM form to go with it.

But recent developments in both micro and memory design and complexity have meant that it is now possible to mount a language interpreter in ROM so that it is always available as part of the system's hardware.

This has already been done in some systems, by using several small capacity devices. It is now possible using just one large memory component.

Added to this is the distinct probability that the more common applications packages will also be available in this form. The main hindrance against this has so far been the fact that most microprocessors do not operate using position independent code, so that memory boards holding applications firmware are a complex engineering task. But recent additions to the roster of available devices, such as Intel's 8086 and Motorola's 6809, do work in such a way.

It should therefore be possible to purchase chips from a retail shop, place them anywhere within reason on a printed circuit board, and build a system with language interpreter and application packages with considerable ease.

This is obviously an area of the market that the semiconductor manufacturing companies would be pleased to see develop. They are, after all, in the business of selling their products in high volume, and this is an area where such volume could exist. If firmware packages became readily available, it is certain that the pricing of them would soon become extremely attractive.

Though the sample was of one opinion in software, there were several different views expressed about possible hardware developments over the next couple of years.

One suggestion is of particular importance, to both future customers and the manufacturers and suppliers already in the business. This is that a "name" company will come to the fore during the next two years, and will become firmly entrenched as the market leader in hardware — and possibly software as well.

As to which company that might be, there were no suggestions, but recent developments indicate two possible contenders. Following its move into the market with Apple II systems, the announcement by ITT that it is to manufacture the hardware under licence is a clear indication of the company's intentions.

There is also the oft-rumoured entry by Texas Instruments, which now seems to be forming its plans along the lines of a range of hardware that will cover professional, commercial and domestic market areas.

Other giant companies, such as IBM, are rumoured to be looking at the market closely. The "name" will probably come from one of these.

Whatever happens to the hardware of personal computer systems over the next two years, the big development seen by the industry is packaged software. Inexpensive applications packages that require the minimum of tailoring to meet individual customers requirements are seen by many in the industry as one of the key factors in spurring the growth in the market for systems hardware.

These packages are, however, not yet with us, and one of the prime reasons is that there is currently nobody around writing them.

Beyond home and hobbyist

● From page 13

estimate being slightly down, at 18.33%. The degree of variance reduced slightly, to rest between 10% to 30%, giving a 1980 market value that should lie somewhere between £4 million and £11 million.

As for the genuine hobbyist and home user, who buys a personal computer for personal edification, aggrandisement, entertainment, or pure swank, they take only a small share of the total market.

The highest estimate for 1978, is 30% of the total market, while the lowest is around the 5% mark. The average estimate, at 15% of the total market, puts a 1978 total value on the sector of only £825,000.

By 1980, the percentage share will drop below even this figure, so the industry thinks. The average estimate is 10.83% of the total market, and while one estimate suggested a 20% share for hobbyists, others put the share as low as 5%. This gives a projected total value for the sector that will lie somewhere between £2 million and £7.5 million.

The final category in the survey, the purposely undefined "other", has been used as a depository of all the purchasers and applications the industry has encountered that did not fit neatly into one of the more specific categories.

Into this catch-penny slot, however, the sample surveyed placed a total of nearly £250,000 worth of business as the estimate for this year, the average estimate of the total market being 4.5%. While the lowest share attributed to it for this year was zero, some suggested that it could take as much as 10% of the total market.

By 1980, the sample expects to see this sector actually expand up to an average estimated share of 5.33%. Again, the variance in opinion ranged between 0 and 10%, but the expectation is that some £2 millions worth of business will be generated by this sector.

Useful techniques for distribution of software

Packaged software in personal computing has expanded to such a stage that virtually any computer user can distribute software. In this article KEVIN CRUMBALL and BOB JONES, both of whom are systems programmers at Micro Focus, consider the commonly used techniques for software distribution in the broad spectrum of the micro market. They write that the selection of distribution medium should be taken very seriously and consideration should be given to alternative media available, even when this entails capital investment.

Crumball and Jones go on to describe the various media currently available to the user and discuss, in depth, their particular advantages and disadvantages, in relation to the requirements of particular sections of the market.

THE personal computing phenomenon has expanded the horizon for packaged software to the point where virtually any computer user can distribute software, if he so desires.

Much consideration should be given to the various media available and their suitability to the particular product; after all, you wouldn't serve Mouton Rothschild from a milk bottle; conversely, you wouldn't sell lemonade in crystal decanters.

The prime question a potential distributor should ask himself is "Who am I aiming at?" This will cover such factors as home/business users, high/low volume sales, importance attached to capital investment and performance requirements.

The answer to this fundamental question obviously affects the package development, but often ignored is its effect on marketing. This oversight may have fatal consequences to the company concerned, as lack of foresight in marketing may lead to an unsaleable product.

The selection of distribution medium should be anything but the lottery it frequently is; serious consideration should be given to alternative media available even when this entails capital investment.

The three most important media currently available are the cassette deck, the floppy disc and the programmable read only memory. Also worth consideration are paper tape, though now declining in most fields, and telecommunication systems, such as viewdata and computer networks.

Cassette based systems have a wide user base in the personal computing sector of the market. They have the distinct advantage of being cheap and widely available, and the cassettes themselves are generally robust, easy to store and re-useable.

However, cost advantages must be offset against reliability and speed, and it is generally true that you get what you pay for. Unfortunately, a wide range of recording standards exist, and, for mass-market distribution, this may require a large capital investment to cover all of the market.

While they are reasonably efficient for handling of sequential data, such as program loads, they are very inefficient where random access is required. Error rates depend largely on the quality of tape and deck used in the system, although sophisticated interfacing techniques may improve this. The capacity of a cassette depends on the length of the tape, ie C30, C60, etc, and on the recording standard employed. Typically, it ranges from 10K to 100K on a C30 tape.

Floppy disc based systems span the range from the top end of the personal market to sophisticated microcomputer development systems. They are usually associated with a filing or operating system and the capital investment ranges from £400 to £4,000, although this should decrease with the advent of single-chip controllers.

In common with cassettes, there are a number of standards, and similar problems exist. Random access is relatively fast, and data transfer is typically by direct memory access which results in transfer rates of up to 40K baud. Standard floppy discs cost about £4 each and can hold 256 K bytes of data. They can be easily damaged by a careless operator, but are durable with careful handling and have a low error rate.

The discs are sometimes faulty on delivery, but manufacturers are normally co-operative over replacing them. Ordered storage of discs is easy to achieve. Discs can be re-used, and they can also be physically write-protected.

PROMs differ from the magnetic media in that they are usually built into the target computer and are usually executable programs such as monitors, compilers and video drivers. They are generally used only for special applications, and are usually as fast as the host microprocessor. They are very reliable and durable once installed, but require specialist handling during installation.

PROMs are not re-useable unless they are of the erasable variety, which is slower and more expensive. To program PROMs a special programmer is required. This costs in the region of £1,000 to £2,000, but will only be required by the distributor. Suppliers of PROMs may offer programming facilities, but in the long run this may work out more expensive.

In either case, PROMs are an expensive way of distributing software since they cost about £4 per K byte, plus programming and installation costs.

Telecommunication systems are a relatively new and unproven method of distributing software to a wide market. However, with the dramatic fall in modems and interfacing costs it is becoming apparent that the current low volume of traffic will increase, especially at the international level. This will open an international market place for any network user.

The problems of charging have yet to be resolved, hence no realistic comparison as yet can be drawn. However, firms will be well advised to keep abreast of developments in this field.

Paper tape, contrary to popular belief, is still in fairly widespread use and affords a cheap method of data entry to almost any system. Furthermore, source programs can be distributed at very low cost without the need for a computer since they can be copied on an ASR 33 teletype. It is popular in the personal market since second-hand paper tape readers can be obtained for about £40. It has few advantages not matched by cassette drives, and is both non-reuseable and fragile in use.

Other methods of program distribution include: bar codes, source listings and hexadecimal listings. These are largely published in hobby magazines and revenue is collected from the publisher rather than the end user.

Having chosen the distribution medium or media, it is then appropriate to consider how much of the potential product is to be distributed. There are broadly three levels of distribution: 1 Executable code and operating instructions only; 2 The above plus some internal details allowing modifications or enhancements to be made; 3 Full documentation including source code.

The first and lowest level option is the easiest to administer, and it is also the cheapest to the user. This is the solution most commonly adopted. However, for various reasons, notably games programs, and where non-standard devices may be used in a system, one of the other solutions may be appropriate. The decision taken at this point may make it necessary to revise the decisions as to media. The two should thus be seen in conjunction with each other and additionally with the question of product maintenance.

There are two main classes of software maintenance: bug correction and product updates. Bugs will always occur in software and this should be taken into account when pricing.

For the bulk of applications, bugs will slip through the net of the tester only to be caught by the irate user. When the fix required is found, it may be provided either by the user himself or the distributor.

In the latter case some form of pricing must be applied. This may be included in the original purchase price or as a maintenance agreement.

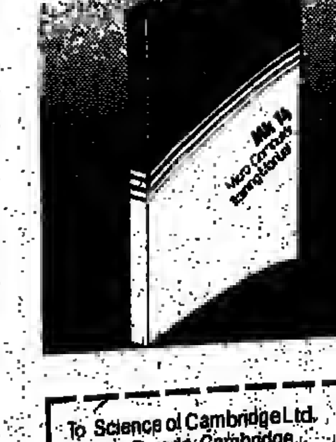
Once a correction to a bug has been found, there is still the problem of distribution among affected users. This can be done in three stages:

1 Issue a patch. This will usually be in the form of a written notice accompanied by a listing. The user then enters the patch on his own system, but this method is not usually applicable to PROMs.

2 Exchange media. This can be done by returning the original media for reprogramming or by supplying a blank which the distributor programs. This works for all the media considered and is especially cost-effective for fast reuseable media.

3 New releases of software. These are not generally done for bugs alone, unless they are crucial. They may also incorporate software enhancements or modifications forced by legislation, eg VAT and tax rates, etc.

> ***Much consideration should be given to the various media available and their suitability to the particular product; after all you wouldn't serve Mouton Rothschild from a milk bottle.***



One of the major problems facing computing service companies is the acute shortage of skilled staff. Although this shortage might seem to be of great benefit to staff already in the computing business, as it offers a large pool of interesting vacancies, in the long run the present situation could be damaging both to employee and employer.

In this article, ALAN BENJAMIN (pictured right), director-general of the Computing Services Association, analyses the problems and provides some practical suggestions for improving and stabilising the job market.

Communications is the key to stabilising the job market

RECENTLY, I have been in discussions with CSA member companies and some of their employees about the difficult situation which now exists as a result of the staff shortage. As always, there are two sides to any story, and since the chaotic state of the job market in computing, in my view, helps no one in the long run, I shall try to persuade readers that now is a time for both employers and employees to stop and think about jobs in our industry.

Many factors are conspiring to make conditions for seeking and finding computing staff extremely difficult, if not impossible. Firstly, the education and training system failed lamentably to invest in data processing courses, methods and techniques *per se* and as part of other disciplines.

Worst in this area of failure was the neglect in producing qualified people to teach the application of computing. The result of this has been that the pool of people entering the industry has been too small and there is still widespread misunderstanding.

Then the computing industry, with some exceptions, failed to create and maintain formal in-house programmes of graduate, professional and school-leaving personnel. Therefore no momentum was created for a constant stream of people to enter the industry. This was compounded by the 1971 recession when computing companies at best stopped recruiting, and at worst laid off (albeit small) numbers of employees. This interrupted the small flow of entrants to the industry.

Since 1972 there has been a sustained growth of computing by users and in the services industry. This was spurred on after 1973 with the availability of lower cost minis and again by developments in data communications.

Competition for staff — especially skilled and experienced staff — grew in intensity, and the activities of the specialist recruitment companies, which were able to present job opportunities so much more effectively, increased the demand. Finally, as with any skill shortage, the pay policy with its rigorous criteria for increases ensured that the only way for many computer staff to gain useful increases in salary was to move jobs.

This condition is still with us today. So are the requirements of the Price Commission with regard to the admissibility of pay increases to sustain increases in charges.

In short, conditions could not have been designed better to produce a shortage of skills, competition for those skills and the constraints upon computing utilisation and growth that this shortage now imposes. And imposes at a time when Britain is poised for its biggest leap forward in the technology for years with profound implications for the economy and the restructuring of the manufacturing process because of the microprocessor revolution.

There is always a moment when, in the headlong rush for growth and development, it is wise to pause and ask questions about the means as well as the ends. In the case we are discussing the constant circulation of skilled and experienced staff brings only lasting benefits to the Inland Revenue.

Pay increases achieved by moving job frequently do, of course, leave their recipient with the after tax increase, but what else?

Before looking at both sides of the equation, let me emphasise that I am really striving for a balance between the present chaos in the computing labour market and the mobility which is a necessary condition for growth, technology transfer and entrepreneurial activity.

Taking the employee's viewpoint first, I readily accept and encourage anyone's right to improve their position in life. Faced as he, or she, is with inflation, high taxation and until very recently with an economy above all running out of hope, it is not surprising that employees seek salary increases with great energy. The social legislation which has come on to the statute book has created an environment for shortages of skills to be exploited.

> ***Many factors are conspiring to make conditions for seeking and finding computing staff extremely difficult, if not impossible.***

Again, the employee in computing cannot yet see clear career paths either in his own sector of operations or in a recognition of his skills by general management. This is much less true in the computing services industry, which has developed these conditions, and is one reason why a period of employment in the services sector is so attractive.

By and large computing employees do not enjoy excessive fringe benefits, receiving much the same, by way of compensation packages, as employees in other industries. On the other hand he is in demand and, faced with an employer who abides by the pay policy, compares the 10% increase in pay (6% after tax) with up to 25% which he may get by responding to the advertised offers for jobs which he apparently can fill.

Well, there are some other considerations. His reputation is built at least in part on his achievements which must be referenced. A curriculum vitae which reveals three or four jobs in say, two years, suggests that the owner has not had time to deliver proven work over any time scale. Or, alternatively, large systems experience has not been completed. Or that there has been no time for performance evaluation and job appraisal leading to promotion. These are noticeable gaps and a careful employer will observe these factors.

Job satisfaction derives in part from contributing to the progress of the organisation for which one works, as well as relating to the technical challenge and content of the work to be done. This requires some stability of employment and some job objectives being met. Increases in remuneration in a stable job environment, with promotions and completed project references are a sound background from which to progress.

If all computing employees were to remain with an organisation for three years — an impossible and perhaps an undesirable condition — the skill shortage would transpose itself into a manpower shortage which, with the right entry policies, could be solved within a few years.

The employee should also consider the non-salary conditions which apply to his job and examine very closely the comparative conditions which are attached to a job-hop salary increase. Is the pension contributory? Is it indexed? What are the health and medical insurances and are they as comprehensive? What about holidays, working conditions, promotion and the project beyond the one for which his services are sought?

Some thought should be given by the employee who contemplates a move, to promotion and organisational comfort. An objective analysis of his achievements in his present job is useful. Are they identifiable and can they be referenced? Is he comfortable organisationally? That is, are his responsibilities, both for projects or people, within his range of experience and competence and is he stretched? In any move, can he identify how his organisational position will align itself with his style or expectation?

I am sure that many people who move jobs do give considerable thought to these matters, but I have seen evidence that many do not. And many people move without a preliminary discussion with their present management about their changing needs. I have found that where this does happen (inevitably in the better managed companies) ways and means are found for needs to be satisfied.

Combinations of new appointments, changing responsibilities, travel or often just better communications, can often preserve the one thing which must in some measure benefit both parties, and that is continuity.

Which brings me to another old fashioned word, loyalty. We hear so much today that computing people are loyal to their profession and not their employer. This reaches the extreme in the US, where large Federal contracts are renewed on open tender. If the incumbent company loses to a competitor, the entire resource, people, machines, everything, leaves company A and joins company B. No one has quite worked out what happens when the contract terminates altogether.

More often, however, the young employee asks "Why should I be loyal; I work for my pay?" Well, one thing is true, your employer will have to earn your loyalty and he will have to give you reason for finding pride in being a member of his company. But if he does, do you respond? How can you demonstrate this quality? One way is continuity of employment, riding with the company through good and bad times, and if you are keen to move for the best of reasons, then do so from a standpoint which includes the convenience, or at least the minimum disturbance to, your current employer.

Finally, another question which might be asked more often is, "Will this be a better company if I stay?" Sometimes people, both employers and managers as well as employees, need to surmount career thresholds and personal hurdles which appear from time to time and staying may provide answers which are as successful as leaving.

A last thought for the employee is that he should take care not to price himself out of the market; if he becomes too expensive his yield will drop.

Now, from the employer's viewpoint, simply to reverse the coin on the above discussion is not enough. It is a genuinely complex task to cope managerially with a burgeoning industry which embraces a technology with a high rate of challenge and a critical shortage of skills. It is only now that senior management in the computing services industry has reached an age and has earned enough experience to begin to develop techniques of communications which will enhance the stability of the labour scene.

> ***A curriculum vitae which reveals three or four jobs in say two years, suggests that the owner has not had time to deliver proven work over any timescale.***

Managing computing professionals, who are articulate, well educated, positive and young, in a social environment where participation, consultation and decision sharing are the props to any discussion about employment, has not proved easy. Indeed, despite this, the progress has been remarkable so far. Some computing service employers, conscious of the need to give example and to maintain financial stability take a puritan view of things and work on revenue-earning projects all the time. They will face a threshold in their growth when priorities change and the need to communicate with colleagues is greater than a few hundred pounds per week in fees.

But, if employers want more stability in the labour market and wish to reduce the cost of recruitment, then it must be worthwhile finding those issues which give rise to labour turnover with all the disruption which ensues, and concentrating management attention upon them.

If we take pay policy as one difficult area, it is clear that CSA members, for example, prefer to honour the national commitment. The difficulties of contractual performance for example, in government-based contracts, added to Price Commission requirements, are just two reasons. Many see the need, however, for some cost restraint and, therefore, pay restraint, in sheer marketing terms.

Employers faced with recruiting new employees, whose skills are no better than existing employees but whose salary demands are much higher, face an almost impossible problem. Perhaps more systems of results-based remuneration or profit sharing should operate. The dangers of this approach are well known and the interdependence of employees in the computing industry is as marked as elsewhere.

There is merit, however, in strengthening communications with employees, about the value of other benefits, about organisational strategy and about company objectives, etc; so that pay becomes one of only a number of factors governing the employer/employee relationship.

Employers who take visible steps to recruit "at the bottom", that is to bring in trainees and grow them, usually command more respect from existing employees. One CSA member, a small software house, takes one graduate a year from his local polytechnic, and it is one of the most sought after jobs, according to the local head of department. This year, he will take two and, in the five years since he started, all the graduates are still there, with two of them in management jobs.

Communications is the most important factor in my view which concerns the stabilising of the computing job market. Stabilising does not mean making rigid. It means that the kind of mobility which takes place is healthy, reasoned and above all is not one-dimensional. For this to happen, communications must be good with employees, with government in relation to policies which affect companies, and with colleagues, for example with fellow CSA members, so that common problems and approaches can be discussed.

This is not the place for a discussion on techniques of communications but only a place to emphasise to employers in the computing industry that if they succeed with communications they will almost certainly succeed with all else.

It is time to stop and think about jobs in computing, time for people to pause and think about whether the frenzied movement taking place at the moment cannot be calmed to a combination of higher productivity and improved communications. Changing one's job for the best reasons will contribute to growth, also building new entrants will contribute to growth and growth to employment, profits and more opportunities.

It is a difficult balance to get right, but it is worth the try.

Intelligent copiers

● From front page

laser or optically from the face of a screen.

Then copies are made from the drum electrostatically in the same way as an ordinary office copier works. The light changes the electrostatic charge on the drum, black powder or "toner" is picked up by the charge and the toner is then transferred to the paper.

Printing this way is much faster than the current impact printers: 30 copies can be made per minute. A wide range of type faces can be held in ROM, all of which are available at the same time without any need for changing daisy wheels.

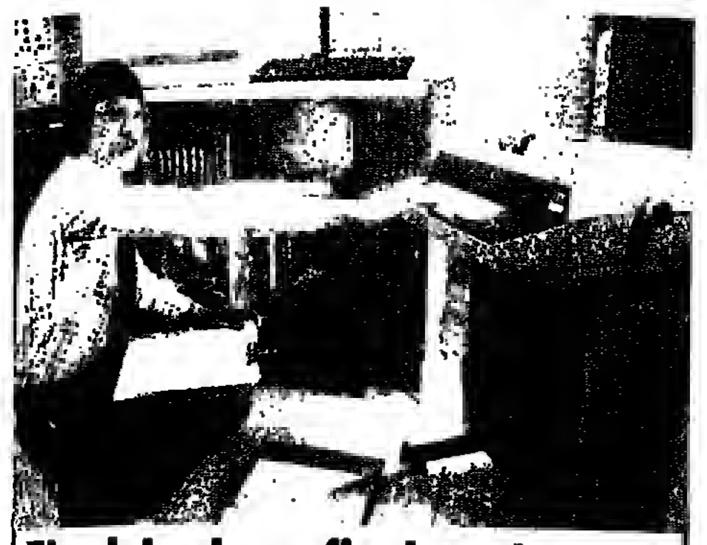
The machines can also be used as ordinary copiers, which is useful as they can get through their word processing printing very quickly and therefore should have plenty of idle time. They have a glass read station like normal copiers from which any document, containing text or graphics, can be copied.

Xerox will say very little about the Workstation but it is understood to constitute a screen word processor with an "intelligent copier" printer and some graphics capability.

Charts and graphs can be drawn on the screen — which is larger than most WP screens now — using a joystick. The printer can then reproduce these along with any text desired, without difficulty.

The Workstation writes the information on to the drum with a laser; the Wang and Toshiba machines draw the characters on the face of a CRT, from where it is transferred to the drum by a bundle of optical fibres. The principle is the same as that used by IBM's laser printer, but the machines are much slower, and cheaper.

Another advantage of the intelligent copier is that it can be used as a type of facsimile receiver, since the electrical signal can come from as far away as one likes.



Final test on first system

Final test is carried out on the first ITT 6100 ADX message switching system to leave ITT Business Systems Group's Borehamwood factory.

Costing up to £26,000 for a typical system (and less for a simpler one), the 6100 ADX is the low-cost successor to the 600 and 6400 ADXs.

Launched at Communications 78, it uses Intel 8080 microprocessors to store and forward messages between as many as 64 leased lines and 16 dialled telex lines at up to 30 characters per second.

Messages are logged, and can be checked and rerouted via a VDU. Receive and transmit can take place at different speeds, with messages held on cartridge disc while awaiting transmission. Engaged numbers are automatically redialled.

The company says that low cost is achieved through volume production and use of LSI technology.

Electronic money council set up in US

IN an effort to promote public understanding of Electronic Funds Transfer, and to overcome consumer resistance, a group of US financial institutions has set up the Electronic Money Council. The council has carried out a study of consumer attitudes and is launching a publicity campaign about EFT.

The future of EFT in the US is in considerable doubt. Sales of automated cashiers and related equipment have been lower than forecast, but bankers and manufacturers seem on the whole to be optimistic, certainly more so than in the UK, where a recent report said that EFT would not come nearly as quickly as had been predicted (CW, June 1).

Promoters of EFT in the US feel that consumer resistance and the scepticism of bankers are the main obstacles to growth of EFT; hence the promotion campaign. The Council's study found that fewer than half of those interviewed had ever heard of EFT, but of those familiar with it only 24 per cent were opposed.

The Electronic Money Council also wants to prevent EFT from being over-regulated by the government. To this end it has produced a code of conduct for service providers which it calls the Consumer Bill of Rights, in an effort to pre-empt legislation.

Herb Wegner, co-chairman of the Council and president of Credit Union National Association, explained, "We have no illusions that public attitudes can be changed quickly. Some consumer activists, legislators, and opinion leaders will remain sceptical, at best. Our objective is a fair and balanced treatment in the Press, in government, and in the minds of consumers. Specifically, we seek to prevent EFT from being over-regulated before the public has the opportunity to appraise it fairly."

Of the opponents of EFT found by the survey, the largest number, 19 per cent, objected because of fear of error. Close behind, 17 per cent were afraid that the added convenience of EFT would encourage overspending. Overall, of those questioned, after EFT had been explained to them, 33 per cent thought it should be encouraged, 32 per cent thought it should be prohibited, and 35 per cent were undecided.

'50% of revenues from software' by 1988

THE percentage of IBM's revenues deriving from software products will increase from 3 per cent to 40 per cent or even 50 per cent over the next ten years, according to one of the speakers at the forthcoming Infotech conference, computer industry investment analyst Bill Easterbrook.

In his paper on IBM and the threat from plug compatible suppliers, Easterbrook predicts that IBM will unbundle its systems software charges and also modularise its systems software to a much greater extent in order to make it harder for PCMs to stay price competitive with IBM and to copy changes made by the industry leader.

Easterbrook also sees IBM modularising hardware to a much greater extent, producing individual hardware/systems software/microcode packages dedicated to functions such as language processing (like Burroughs Attached Fortran Processor), database management and data communications, as well as central processing.

One of the advantages to IBM of adopting this approach, according to Easterbrook, will be that it will make anti-trust actions taken by PCMs against IBM even more complex than the cases that have already been heard.

This was underlined recently by the Memorex case, where the judge ruled in favour of IBM after the jury had failed to come to a unanimous verdict, and asserted that the case was far too complicated for a jury to understand.

Looking at one of IBM's most powerful weapons against the plug compatible CPU manufacturers, microcode, Easterbrook predicts that IBM will accelerate the rate of introduction of separately priced modules of its operating software implemented in microcode.

Easterbrook points out that it would take an independent manufacturer between six months and two years to produce a duplicate of each new IBM microcode module after its announcement by IBM. The first shipments of the product and its specification would not take place for three months to a year after its announcement and the time taken after that to copy the product would be at least three months and as much as a year.

Easterbrook concludes that IBM's policies of unbundling software and modularising hardware and software will help to maintain its profit growth and constrain PCMs over the longer term. He predicts that some PCMs will survive and a few may thrive, depending on their ability to become independent of IBM software and their agility in maintaining interface compatibility with IBM products.

Repeat performance of 'IBM—the next five years'

FOLLOWING the success of the conference "IBM — the next five years" in March, the organisers, Infotech, are staging a repeat performance from September 11/13.

As in March, the subject matter will cover most aspects of IBM's activities, present and future, but most of the speakers will be different and the London venue has also been changed — from the Connaught Rooms to the Greenwood Theatre, SE1.

The conference opens on the morning of September 11 with a session presented by Ulric Weil, who spent 16 years with IBM specialising in market evaluation and competitive systems analysis. Weil is now in charge of EDP market analysis at Morgan Stanley, a prominent New York investment and market analysis company. He will discuss and diagnose the economic state of IBM and its competitors in the near future, and evaluate trends in the cost of current and forthcoming technologies.

The forthcoming E and H mainframe series from IBM will be the subject of a paper to be presented at the conference by Bill O'Connell, senior vice-president of corporate marketing at Amdahl Corp, the firm that offers direct alternatives to the top end machines in the existing IBM 370 series.

Another firm that challenges IBM head on in its own marketplace, Memorex, will be represented at the conference by Dan O'Brien, marketing manager for the firm's large storage systems group. O'Brien will look at possible future peripheral systems from IBM, including new storage and I/O devices.

Another threat to IBM's huge base of mainframe computers — distributed processing — and the ways in which IBM is trying to eliminate the main rationale for it by promoting low cost satellite data communications, will be discussed in a paper on Satellite Business Systems by Howard Anderson of the Yankee Group.

The second day of the conference starts with two papers on software matters — systems software and databases.

Dick Bayles, of National CSS, the big US-based time-sharing bureau, will talk about the extension of IBM's software unbundling into systems software and the migration of systems functions into firmware and hardware. He will also consider the effects of these trends on future IBM architectures and on the manufacturers of IBM compatible processors.

Stephen Robinson, president of S L Robinson and Associates, a US firm that specialises in consultancy and educational services relating to databases, will discuss the likelihood of IBM adopting a database architecture base on the ANSI and Codasyl proposals and involving a "back end" database machine.

Returning to the plug compatible challenge to IBM, Bill Easterbrook, of the US investment banking firm Kidder Peabody & Co, will list the powerful battery of economic weapons that IBM can use against the PCMs.

Conflicts within IBM itself, between the mainframe manufacturing Data Processing Division, regarded as the heart of IBM, and the shortly to be merged Office Products and General Systems Divisions, which are now moving into rich new markets, will be discussed by consultant Phil Dorn, in a paper on IBM's shifting revenue sources.

The third day of the conference includes sessions on communications, IBM's position in Europe, and the user view of IBM, and rounds off with a forum in which the speakers will answer questions from the floor.

In his paper on IBM's networking and data communications plans, Howard Frank, president of the Network Analysis Corp, will consider how IBM's networking concepts, in particular Systems Network Architecture, SNA, will be extended or modified.

Possible areas of confrontation between European telecommunications authorities and IBM will be one of the main topics of the paper on IBM in Europe, to be presented by David Butler, of Butler Cox and Partners.

IBM's pricing, support and maintenance policies and their effects on users will be looked at by Alan Duncan, the technical adviser to the management service division of Barclays Bank, one of the largest IBM users in Europe.

Tutorial on SNA, packet switching

THE three-day conference at the Greenwood Theatre costs £310, and for another £160 delegates can stay on for two more days to take part in a tutorial on SNA and packet switching. This will be led by Howard Frank of the Network Analysis Corp, who is also presenting a formal paper on the subject on the third day of the conference.

On September 14, Dr Frank will start by describing the various types of network that exist today — centralised, distributed and hierarchical — and the equipment used in them like controllers, concentrators and packet switches. He will then talk about network protocols and lead from this into a description of SNA.

The subject matter on day two will include the structure of packet switched networks today and a look at new application areas and trends. The tutorial will end with a discussion of distributed processing, electronic mail and the office of the future.

The tutorial alone can be attended for £210.

Swansea returns to work

THE issue of driving licences and vehicle registration documents from the Swansea Driving and Vehicle Licensing Centre resumed last week following the return to normal working by maintenance engineers who were refusing to service the centre's air conditioning system. The action shut down the three ICL System 4s at the centre for two weeks, and was in support of a pay claim by government blue collar workers.

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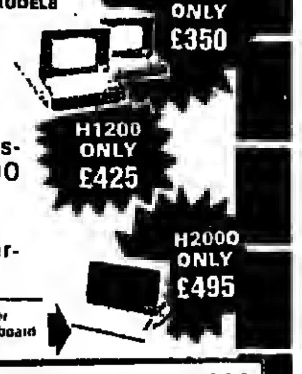

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APPOINTMENTS IN IRELAND

Eire needs to attract home its expatriates

To help meet the need for more skilled computer staff, of which there is an acute shortage at present, PAT RAFTER, managing director of Insight Marketing and Personnel Consultants, Dublin, gives here an overview of the computer industry in Ireland. Rafter has been in the computer business for 19 years and has covered most aspects of the industry from both sides, manufacturers as well as users. He is also a member of the Irish Computer Society.

PEOPLE are now beginning to realise the importance of the computer as an influence on their everyday lives. Earlier this year, Time magazine included a 15-page feature to explain the background of what is now the most advanced and fastest-growing industry in the world, and to indicate the impact which we can expect recent developments will have on our normal day-to-day lives. Even the pocket calculator has now been enhanced by the inclusion of microcomputers.

The key to the application of this computational power is the development of software or the programs and instructions needed to make computers intelligent.

To develop software at all levels, you need skilled personnel; not just people with a strong scientific or mathematical bias, but also people with logical minds and a keen interest in problem solving.

With the continuing technological breakthroughs and developments on the "hardware" side of the industry, the most constraining factor on the use of computers is the availability of computer personnel. This was true at the beginning, nearly 20 years ago, and it is still true in 1978.

But some of the more enlightened countries have started to take significant steps to: 1 Make students both at first and second level education aware of computers and the computer industry. 2 Gear themselves at third level education to produce a substantial number of graduates in computer or related sciences, to help meet the ever-increasing demand for computer specialists generated by the continued growth in the use of computers.

In Ireland, things have moved far too slowly. A student at first level gets virtually no exposure to computers and it is only recently that, in a limited number of schools, the second level student has had an opportunity to appreciate the computer and its potential and to realise that there is such a thing as a computer industry in Ireland.

At third level, our institutes and universities do provide both diploma and degree courses, but facilities are limited and the qualified output annually from our colleges clearly falls far short of demand.

The growth curve in the use of computers and related services here lags behind the UK and the Continent by at least two to three years. We are currently experiencing a high rate of growth and in addition we are seeing a boom in the establishment of specialist software houses, assisted by government development grants, both to support the home market and also with an export bias.

The public services and other units within the public sector are committed to developing their own computer personnel. However, the progress of many of their development programs has been hindered by the shortage of suitable personnel.

Where there is a time constraint on an urgent project, this has led them to look for the "packaged" or "turnkey" solution.

In the private or commercial sector when a decision is made to implement a project the required completion date is generally "yesterday". Here again the turnkey solution tends to be favoured, hence an increasing demand on computer manufacturers, computer consultants and software houses to provide high quality, high output computer specialists to speedily implement a wide variety of projects.

As many of these projects have been cost justified on benefits which will accrue from their speedy and successful implementation, timescale is of the essence and the cost of the personnel involved tends to be a lesser consideration.

As a result, everyone requires experienced staff with a proven track record which will enable their employers to put them to productive use as quickly as possible. Because of the limited resource in this country, this frequently results in a frantic search for suitable personnel ending in "head hunting". Though there is no ideal or immediate solution to this dilemma, two avenues of approach immediately come to mind.

Firstly, in spite of budget and manpower constraints, computer users and suppliers should allocate a percentage of their budget to a trainee program at either school leaver level or graduate level to go some way towards providing a source of trained personnel.

Secondly, efforts should be made to attract expatriates from UK and overseas back to this country, thus going some way towards meeting the current need for trained personnel.

Viewed from a number of management positions which I have held in the industry it has been clear to me that the recruitment of skilled computer personnel, whether they are fulfilling a marketing or a technical role is more complex than many other industries and the successful consultant needs to have an in-depth knowledge of the industry to enable him to correctly identify the client's needs, and to communicate with and accurately assess, potential candidates and their suitability for a particular job or project.

RAFTER ..... "In Ireland, things have moved far too slowly."

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Ref. W1/2408

24-hour answering service

Please telephone for a confidential discussion or write to:
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01-353 0981

DERBYSHIRE CONSTABULARY

Applications are invited for the following post at Force Headquarters, Ripley, Derbyshire. A job description is available.

SYSTEMS ANALYSTS

The salary will be in accordance with the N.J.C. Scale SO.1/2 £4,920-£5,748 per annum, plus £312 per annum 1976 supplement. The successful candidate will be required to form part of a newly created computer project team.

He/she should have a programming background, preferably in real-time systems, with a working knowledge of a low level language.

He/she will be required to assist in the evaluation, design and implementation of major systems under the direction of the Project Manager. The work will involve the design and development of dedicated on-line computer systems for the Derbyshire Constabulary, which will include Police Command and Control and information systems, from feasibility to implementation; and thereafter continuing systems development and maintenance; also liaison with the Local Authority in connection with the design and development of applications on their mainframe IBM 370/145 computer.

A Degree or appropriate professional qualification is desirable. Suitably qualified disabled persons will be considered.

Application forms from the Chief Constable, Force Headquarters, Ripley, Derbyshire, to be returned by 8th September, 1978.

Contracts

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We also have a limited number of vacancies for graduates with 6-18 months experience.

UNIVERSITY OF YORK
Department of Computer Science

COMPUTER HARDWARE TECHNICIAN

Applications are invited for the above post to assist staff and students in their teaching and research activities. The post principally involves designing, constructing, testing and maintaining electronic equipment in the digital systems laboratory.

Applicants should have some experience of digital electronics and an appropriate qualification. No knowledge of specific computer circuitry is required as training will be given.

Salary on Grade 3 £2,988-£3,060 per annum.

Applications in writing giving the names and addresses of two referees and specifying the post to which application refers, should reach the Deputy Bursar, University of York, Heslington, York YO1 5DD, by Monday, 4th September, 1978.

THE UNIVERSITY OF SHEFFIELD
DEPARTMENT OF ARCHITECTURE

Applications are invited from men and women for a post of

COMPUTER PROGRAMMER

to work on the development of interactive programs for a project which is evaluating the use of computer aided design in architectural practice supported by the S.R.C. Tenure 3 yrs from 1 October 1978. Starting salary £3189 a year. Further details from and applications to Dr B. R. Lawson, Department of Architecture, The University, Sheffield S10 2TN by 1 September, 1978, quoting ref. R180/88.

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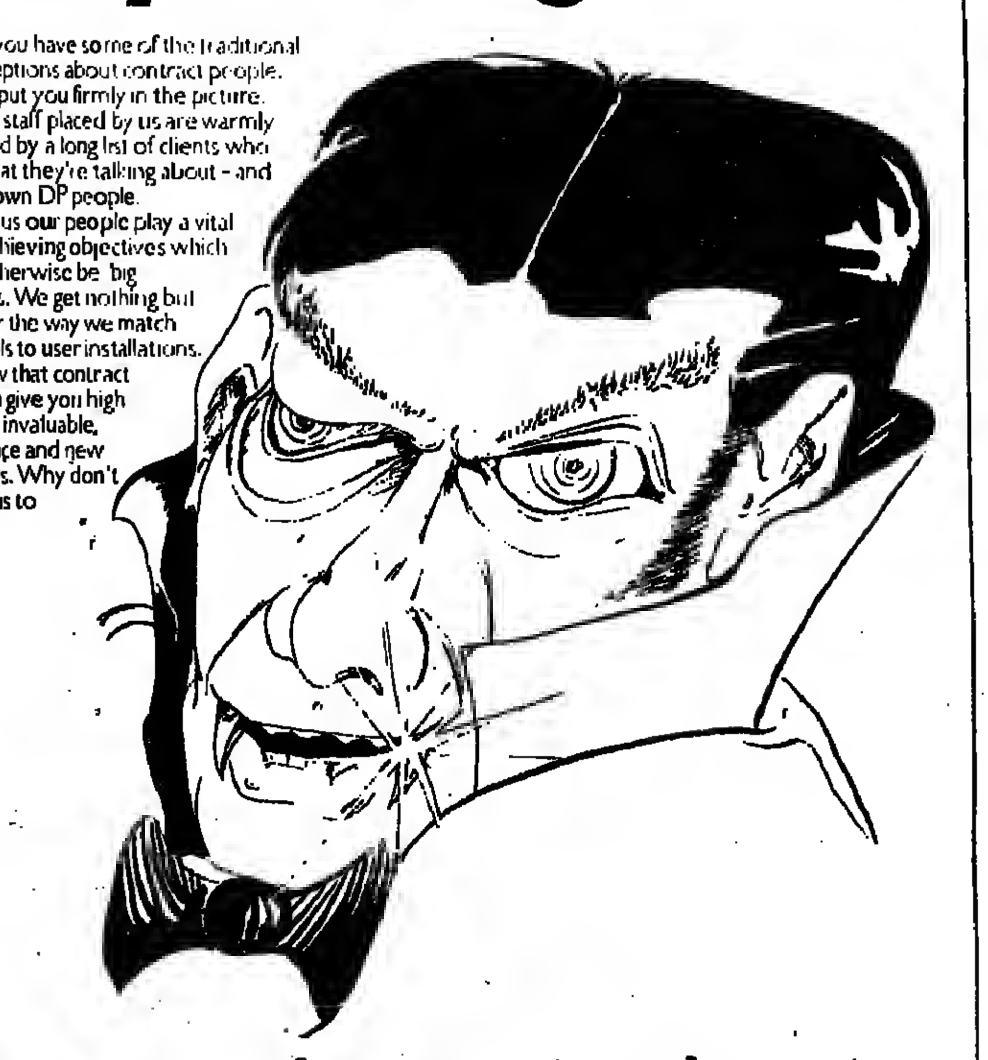

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ICL 1900 G111 Ops. & Data Controllers
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MACRO 10+TOPS 10 - Holland
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Please contact Richard Kaluzynski or Sue Gillam, 01-491 4706 or 01-439 3411.

All vacancies are open to both male and female applicants.

Knight

Knight Computer Services Limited,
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Staff Services Division of BOC Datasolve Group and a member of Computing Services Association.

01-491 4706

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Our Clients are an exciting U.S. and internationally based mini computer manufacturer whose technological innovation has taken them into the top 5 in the mini computer field. Backed by the security and research of a multi-million dollar corporation, their products are taking the traditional and distributed processing markets by storm. This is creating a challenging and dynamic working environment offering excellent prospects for the future both in this Country and overseas.

The successful candidate will take responsibility for a sophisticated range of distributed processing systems currently enjoying a rapidly expanding market. The successful candidate will work in a true product marketing role and responsibilities will be extensive, challenging and range from market research and product definition through to the formation of product strategies and merchandising programs. The determination of pricing policy and control of line profitability will also be key aspect of this position.

The successful candidate should ideally have

- ★ qualification to Degree standard in a related subject
- ★ a good technical understanding of mini computer software/hardware
- ★ an empathy with sales (ideally gained in a direct sales role)
- ★ leader qualities
- ★ aged between 25 and 35

This position will be based in the Northern Home Counties, relocation expenses will be paid to the successful candidate. Other benefits include profit sharing, pension and private patients scheme.

For further details: Ref CW/8/2.

CONTACT. David G. Wade on 061-833 0427 or 0785 56013 after office hours.

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LONDON 01-935 0671
Freepost 6, 102, Blandford Street,
London W1E 1JZ

Computing Services Association

Analyst/ Programmer & Programmers

Additional staff are required to assist in the replacement of the Society's twin NCR Century installation by a 192K Criterion with discs/tapes and on-line terminals.

Applicants should have at least 1 year's Cobol experience and knowledge of NEAT 3 would be an advantage.

The successful applicants will be involved in a variety of projects, including the implementation of an on-line warehouse stock control system, processing of data captured from on and off line P.O.S. terminals and various new accounting systems.

The Society offers competitive salaries, subsidised canteen and normal fringe benefits.

Write or phone for application forms to the Personnel Officer,
Cambridge & District
Co-operative Society Limited,
73 Burleigh Street, Cambridge
CB1 1DW. Telephone
Cambridge 58844 ext. 226.

co op

HEALTH SERVICE COMPUTING

Career openings have arisen at our Computer Centre based at New Southgate, London N11.

Ref. No. 3391

SENIOR SYSTEMS DESIGNER
Salary Scale £5,313-£6,379

Ref. No. 3372

SYSTEMS DESIGNER/PROGRAMMER
Salary Scale £4,775-£5,680

Ref. No. 3383

PROGRAMMER
Salary Scale £3,806-£4,775

Salaries Inclusive of £354 London Weighting

New entrants enter at the minimum of the scale.

Equipment consists of an ICL 1904S, with 10 EDS 60s running under the George 3 operating system with communications facilities, an NCR microfiche processor and Rediffon key-to-disc system.

As well as the Payroll, Accounting, Medical and Scientific applications, staff are required to support a variety of mini computers installed in hospitals and laboratories around the Region.

The main programming languages are COBOL, FORTRAN and PLAN. Appropriate training will be given as required. Flexitime system around a 36-hour week.

Application forms and further particulars from the Regional Personnel Officer, North West Thames Regional Health Authority, 40 Eastbourne Terrace, London W2 3QR (Telephone 01-262 8011, Ext. 261) quoting the appropriate reference number. Closing date 8 September, 1978.

Systems Designers

Saudi Arabia £8,800-£10,900 after tax

Do you have at least 2 years' experience using mark IV on a 370 operating under OS/VS? Have you at least 1 year's experience of COBOL, P/L1 and time sharing option?

Have you worked on major materials/inventory control applications?

If you have, and you also hold a full U.K. driving licence, we would like to hear from you as soon as possible on behalf of the Arabian American Oil Company (ARAMCO).

Appointments are single-status based on 12 month renewable contracts. Bachelors have 30 days paid U.K. leave between contracts, married men on single-status have 2 weeks' paid U.K. leave every 4 months with 25 days between contracts. Excellent medical care is free, housing is air-conditioned and recreational facilities are first-class.

For further details, please write or, better still, telephone, quoting reference S 362, to Richard Darvell at Astral Recruitment Associates,
Astral House, 17-19 Maddox Street,
London W1R 0EY.
Telephone: 01-629 2356 (answerphone after 6 pm).

ARA Astral Recruitment Associates

Systems Analyst

Bahrain c £11,200 p.a. tax free

Systems Analyst/Programmer

Bahrain c £9,800 p.a. tax free

- ★ End of Contract/End of Service Benefit also tax free
- ★ Free furnished accommodation and utilities
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- ★ Free Company primary schooling with generous education assistance for secondary education for eligible children

The Bahrain Petroleum Company Limited, a large company in the oil industry, offers challenging opportunities in its rapidly developing Computer Services Department based at Awali, the Company township in Bahrain. The town, covers an area of nearly a square mile and provides homes, community services and recreational facilities for employees and their families.

The Computer System comprises a System 370/135 with 512K, operating under OS/VS1 and a System 3/12, both with batch and online processing. The data base is TOTAL with ENVIRON for its teleprocessing support.

A wide variety of technical and commercial applications are already in use. Additionally, major areas of development are proceeding making use of real time, remote communication, and data base management techniques.

Systems Analyst

Candidates will be required to carry out feasibility studies, analysis and design systems, prepare system specifications, programming specifications, and user manuals. Candidates must have ability to communicate effectively with various levels of management.

Candidates should have at least 3 years experience in systems analysis and design and must have taken at least one major system from feasibility to implementation.

Practical programming knowledge particularly IBM Cobol is necessary. A knowledge of data base and teleprocessing techniques will be an advantage. Candidates should have a degree, HND or equivalent.

Systems Analyst/Programmer

Candidates must be able to take outline specifications prepared by a Systems Analyst and carry out detailed design, coding, and testing of programmes.

A minimum of 4 years Cobol experience and at least one year's analysis in a 370 environment is essential. A knowledge of TOTAL and ENVIRON is desirable.

It is essential that candidates are self motivated and prepared to work occasionally abnormal hours.

Both the above vacancies will be on the basis of a one year contract renewable by mutual agreement. Free medical attention for employees and married or bachelor furnished accommodation provided.

Please write with full personal details, requesting an application form, to:–

Personnel Relations Department, Caltex (U.K.) Limited,
30 Old Burlington Street, London W1X 2AR.
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UNIVERSITY OF YORK
Department of Computer Science

COMPUTER SOFTWARE TECHNICIAN

Applications are invited for the above post from applicants with some experience of computer programming and an appropriate qualification. The post will involve assisting staff and students in teaching and research activities and includes programming and writing documentation for PDP-11, DEC system-10 and micro-computer systems. No knowledge of specific systems or languages is required as training will be given.

Salary on Grade 3: £2,688-£3,060 p.a.

Applications in writing, giving the names and addresses of two referees, and specifying the post to which application refers, should reach the Deputy Bursar, University of York, Heslington, York YO1 5DD, by Monday, 4 September, 1978.

SYSTEMS ANALYST

new position DERBY AREA to £5,400 p.a.

Our client is a leading engineering concern who are developing Production/Contract Costing/Financial Modelling systems using on-line (real-time) techniques as appropriate.

An additional person, preferably with experience in designing on-line systems, is required to lead or join a project team consisting of user and DP personnel. The company are in a continuing state of expansion and prospects for advancement are excellent.

Good salary together with relocation package plus disturbance allowance will be offered to the successful applicant. Interviews available locally evenings or weekends.

To register for this position, and to obtain further information, please contact LEE RICHFIELD LIMITED (Computer Recruitment Consultants), Bridge Buildings, Ladybridge Road, Cheadle Hulme, Cheshire SK8 5LL. 061-485 0551 day, 061-980 6879 evenings/weekend.

JBA

Senior Systems Programmers

London based £8,000 + bonus/profits

A recently established software house is keen to recruit several highly skilled and professional IBM Systems programmers in order to build a team capable of innovative development work.

From the outset, you will be responsible for seeing that a reputation for quality is established in the market place and for helping to ensure the success of the business, both by your professional approach to the job and by your commitment to the company.

A real opportunity for ambitious self-starters seeking to contribute significantly to success and be well rewarded for results. Gross earnings are unlikely to be less than £9,000 in the first year. Contact: Andy Wright

Technical Authors (Software)

Nr. Uxbridge	c.£6,500	Holland	c.£11,500+package
Herts.	c.£5,000-£6,000	Central London	c.£7,000
Berkshire	c.£6,000-£7,000+	Switzerland	c.£15,000+ package
Surrey	c.£6,500-£7,000		

The above locations indicate a selection of our clients with current vacancies for either *potential* or experienced writers; the salaries stated are definitely on offer for candidates who meet the requirement. In some cases the client concerned is in the process of setting up a technical publications team. In most cases either complete or very generous relocation expenses can be negotiated.

We welcome calls from anyone now engaged in documentation or interested in making a career change into this creative, interesting and financially rewarding work. We have many other clients in other UK locations and overseas. Contact: Mike Creamer

Analyst/Programmers

Coventry c.£5,500

A well known industrial organisation is looking for several Analyst/Programmers to join their expanding systems development teams. Several years as a COBOL programmer is essential together with some experience in the design of at least one commercial application.

Above average salaries and opportunities. Generous benefits including relocation assistance. Contact: Jim Baker

Computer Services Manager

Home Counties up to £12,000 + bonus and car

Our client, one of the largest software houses in Europe, is continuing to expand its services and now requires a senior manager to set up and run a new group offering facilities management and operations support.

Applicants must have an established management record with drive and ambition. A broad based background in the computer industry, some of which should have been with a software house, is essential coupled with an entrepreneurial flair.

This is a senior appointment carrying an appropriate salary and excellent benefits. Contact: Jim Baker

Engineer Programmers

North Surrey £[illegible],500 £8,000

This company, a subsidiary of an extremely large engineering consultancy group, specialises in producing individually tailored industrial systems usually based in either PDP 11 minis or INTEL micros. All successful candidates can have a career leading to Chief Engineer and above – your capabilities and drive will be well rewarded.

Applicants should have at least 4 years mini or micro systems experience with a good knowledge of a low level language. If you also have an Engineering or Electronic design and/or experience of hardware design, this could prove extremely useful.

A career with this company will ensure total involvement in the latest techniques and applications of this type of processing. Contact: Andy Wright

Programmers

London £5,500

A large commercial organisation has opportunities for programmers to join a well established data processing department, to work on the development of new systems.

Candidates should have at least eighteen months experience of COBOL, PLAN or Assembler on an IBM or ICL mainframe. A commercial background with database or real-time application would be an advantage.

Excellent salaries and an opportunity to work in a professional environment. Contact: Jim Baker

For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

Computer Appointments

TEAM LEADER COMPUTER ENGINEER

LONDON To £6,500

A unique opportunity has recently arisen for a senior computer engineer with a special products division of an International organisation.

Applicants should have a minimum of 5 years' computer service experience and exposure to the following:

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- ★ Real Time Application

In return for your experience the company offer:

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Interested? Contact Ian Veltman or Paul Hecquet on 01-439 6299 for a confidential discussion.

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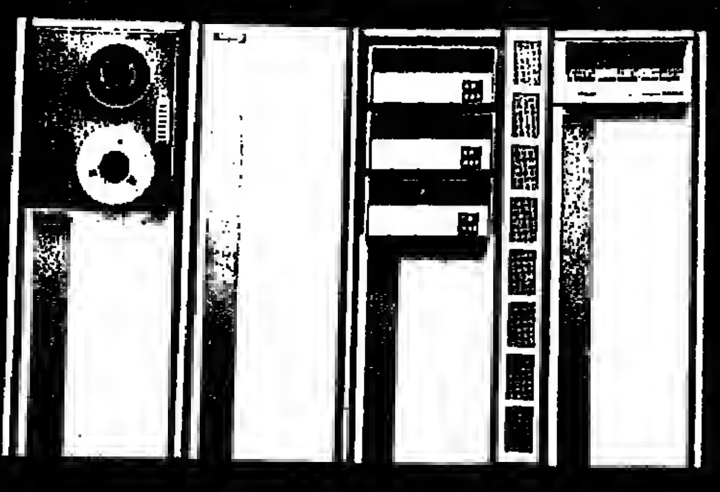
U.S.A.

- *COBOL, PL/1, Assembler
- *IMS – DL/1
- *CICS
- *Mini and Micro Computers

Salaries from £7k to £13k depending upon level of experience plus relocation reimbursement possibilities.

Informal Interviews will be conducted in London August 28th-31st. Appointments may be made by telephoning Ralph Payne at 01-283 4363 on August 28th or by writing with career details to Ralph Payne, Great Eastern Hotel, Liverpool St., London E.C.2.



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COVENTRY – SALES ENGINEER: to £8,000 basic p.a. + commission.

Dynamic sales engineer needed to work from our Coventry office and cover a wide area in the UK. Essentially the person will already have a proven background of successful selling within a mini computer environment. Should preferably have a knowledge of process control, scientific and engineering markets and be capable of the kind of drive and determination that will earn you £5–£6k commission above targets met.

COVENTRY – SYSTEMS SOFTWARE SUPPORT UK: to £6,500 p.a., plus car.

A rewarding job for someone who enjoys getting to grips with complex software problems and who can discuss them with users and engineers. Must have a background of Assembler working on operating systems and systems software, preferably in real-time communications, mainframe or mini. Travel within the UK is obviously involved.

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A similar position to that in Coventry but also offering the opportunity to travel throughout Europe providing technical software support to a wide range of MODCOMP users. It additionally demands co-ordination of information between the various regions and the development group in the United States.

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MODCOMP'S "in-house" functions will include accounting, order processing, production control, etc. This will need a first class COBOL programmer who enjoys being involved from design through to implementation. The person will probably work well alone and a background of commercial programming on minis is preferable, though not essential. An understanding of financial applications is also important, as is an ability to take on the responsibility for implementation.

MODCOMP offers excellent company benefits and good salaries. Benefits include free BUPA coverage and non-contributory pension, excellent working conditions and the opportunity for personal success as MODCOMP grows. Relocation expenses will be considered.

For full details on any of the appointments, contact Anne Campbell on Wokingham (0734) 781179 – or send Anne a resumeé to:

Modular Computer Services Inc.,
The Elms,
26 Broad Street,
Wokingham,
Berks.

MODCOMP
Computer Classics

Operational Systems Development Supervisor

Our client is part of a major British engineering company with manufacturing units throughout the UK. Due to recent expansion and modernisation programmes a number of vacancies have arisen and currently they are seeking an Operational Systems Development Supervisor to be located in the London area.

The ideal candidate, educated to degree level, will have a minimum of three years experience in systems development with one year at supervisory level, and a working knowledge of NCR hardware. Programme languages should include NEAT and a knowledge of COBOL will be an advantage.

On appointment the responsibilities will include personal involvement in analysis and programming, the supervision of analyst programmers and the maintenance and development of existing systems. In addition the Supervisor will be responsible for the implementation of new systems which have been developed at a central site and relate to IBM main frame and mini-computers.

You will be working within a challenging manufacturing environment which will demand initiative and enthusiasm.

Conditions of employment are excellent and include a competitive salary, contributory pension scheme and participation in the company car lease scheme. Relocation assistance will also be available where applicable.

Male or female candidates should write giving full but concise details of age, qualifications, career history and salary progression to date. State the name of any organisation to whom your letter may not be sent and address your application to: Mr R D Taylor, Regional Manager.

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Salary
£4866 - £5403
inclusive of supplement.
Grade AP III/IV

Qualifications
Degree or equivalent
Experience in one of the following areas
Minicomputers and distributed processing
Communications software
On line programme techniques

Duties
The successful candidate will be responsible to the Installation Manager for all programming projects under his/her control

Application forms may be obtained from the Assistant Director of Manpower Services, 21 Gordon Street, Glasgow, G1 3PS, (Tel: 041-221 4275) to whom completed forms should be returned within 14 days of this advertisement appearing in the press. (Ref. 0114).

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BELGIUM £20,000-£24,000 P.A.

PACKET SWITCHING SYSTEM DESIGNERS

—Required initially for the system design phase of advanced packet switching networks utilising newly developed telecommunications hardware. The successful candidates for these positions will probably be in their early 30s, educated to degree standard and will have a career background which includes substantial mini computer experience, Assembler and high level language programming, systems analysis and design on mini computer equipment in a real time telecommunication environment.

—be responsible for the detailed design of such projects assigned to them and the provision of all program specifications and instructions for the members of their project team.

—Be self-motivated enjoying the prospect of working in charge of a small team with major project responsibility.

REF: DCO/010877

Overseas Recruitment Consultant
Employment Business Section
Howard Organisation International Limited
8 Elstree Way, Borehamwood, Herts. WD6 1LE
Tel: 01-935 4066

Management Information Centre
Waltham Forest Precinct

Management Systems Project Leader P01/2

The Job

The North East London Polytechnic Management Information Centre at Waltham Forest is in the process of installing a 2903/30 with a 7502 Modular Terminal Processor, and wish to appoint an experienced analyst capable of spearheading further development of the data management system. The Project Leader will work with a small team of programmers involved in determining future needs for information systems with a wide range of senior managers in the Polytechnic.

The Person

We need to fill this key post with an energetic analyst able to demonstrate considerable personal initiative and managerial ability in a creative environment. A relevant degree or equivalent qualification together with experience of data base, teleprocessing, on-line direct data entry and ICL 2900 systems would be desirable. Inclusive annual salary ranges from £6,012 to £6,627.

Further details and application forms are available from the Personnel Office, North East London Polytechnic, 169 The Grove, Stratford, E15. Telephone: 555 0811 ext. 32, quoting reference no. A545/78. Closing date September 7th, 1978.

NELP North East London Polytechnic

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Computer Personnel Consultants

OPERATIONS SUPERVISOR

WEST OF LONDON **£5500 + Bonus + Car**

This is an excellent opportunity for a person with a sound background in IBM 370 computer operations, who now feels capable of assuming full responsibility for the production functions of a powerful computer centre.

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The person appointed will become responsible for twelve operating and control staff and should therefore have sound technical experience, coupled with proven supervisory ability.

Excellent opportunities exist for progression within the organisation which is currently enjoying excellent trading and is expanding its D.P. activities. The commencing salary is enhanced by first-class conditions of employment including a company car, and a twice yearly bonus which will be a minimum of 10% for the first year.

Ref. W2/240B

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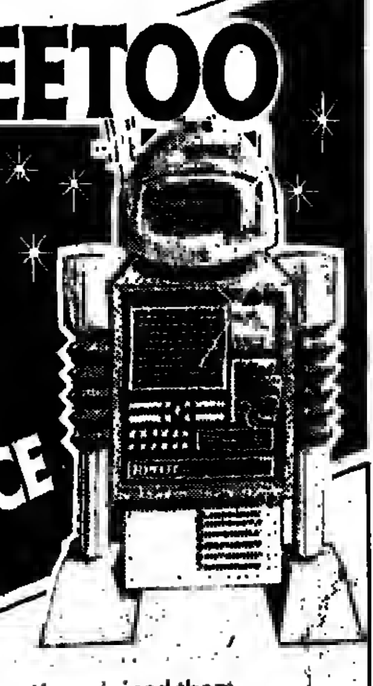

the world's leading expert on **ANALYSTS AND PROGRAMMERS WITH RPG II EXPERIENCE**

This week Arpeegeetoo says *'Why confine your skills to one installation when you could work on hundreds'?*

Don't you find that working for just one user soon ceases to challenge your ability?

After all, once you've set up the system there's not much more to do than twiddle the knobs and tie up the ends, is there?

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They're professionals in RPG II work – they travel around developing and installing systems for various companies in different situations.

If you joined them as an Analyst or Programmer you'd find yourself being asked to solve a variety of problems on one new project after another.

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Don't be surprised at that – Altergo is just about the most successful software group in this country. Business with them is so good, they can afford to make sure they find and keep the right people.

If you want to travel far and wide, that's great. If you'd rather stay roughly where you are now, that's OK too. Either way, there's always plenty of responsibility to be won.

Take my tip – contact Brian Walker, or Barry Whitesman quoting BS/13 on 01-734 9681 or after 8.00 p.m. on 049481 2713.

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Staff Services Division of BOC Datasolve Group and a member of Computing Services Association.

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- is used to work very independently and also prepared to take more responsibility later.

INTERESTED?

Send your CV to Jan Cederlund. DATA GENERAL EUROPE. 61. rue de Courcelles 75008 Paris.

Do not forget to write your contact telephone number. where we can find you during office hours.

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Data General

Customer Service Engineers for the fastest computers in the West!

Cray Research Incorporated, the U.S. manufacturer of the world's fastest computer — the CRAY-1, now needs more highly-skilled people to provide comprehensive installation and service support in the U.K. Junior and Senior Engineers are required:

You should have a sound knowledge of electronics backed by a high mechanical aptitude.

Although eventually based in the Berkshire area, selected candidates will be given comprehensive training in the U.S.A. in their first six months.

These posts carry good salaries — directly linked to individual qualifications and experience — which will be supported by a good range of employee benefits.

So, if you're looking for the opportunity to join a company during an exciting stage of its development, please write with full details to: Stuart Drayton, Chief Engineer, Cray Research Inc. James Glaisher House, Grenville Place, Bracknell, Berkshire, or 'phone him on: Bracknell 21515. Interviews will be held early in September.

CRAY RESEARCH, INC.

Welsh Health Technical Services Organisation

COMPUTER DEPARTMENT

BASIC PROGRAMMER

£4421 – £5326 p.a.

The W.H.T.S.O. Computer Centre provides comprehensive services to all Health Authorities in Wales with an I.C.L. 1904S and associated terminals.

We have positions immediately available for experienced Computer Programmers who should have at least two years service. The salary scale ranges from £4421 – £5326 per annum.

The successful candidate will be required to work 37 hours within 5 days per week.

National Health Service Conditions of Service apply and a contributory superannuation scheme is in operation.

For an application form and further details write or telephone:

The Personnel Division,
Welsh Health Technical Services Organisation,
Heron House, 35/43, Newport Road,
Cardiff CF2 1SB. Tel. Cardiff 499921 Ext 136.

Closing Date: 11 September 1978

COMPUTER CENTRE
Welsh Health Technical Services Organisation
Swyddfa Gwasanaethau Technegol Iechyd Cymru

WHTSO

THE UNIVERSITY OF MANCHESTER INSTITUTE OF SCIENCE AND TECHNOLOGY

MICROPROCESSOR ENGINEERING UNIT

SENIOR PROJECT OFFICER

A new senior appointment has been created to take charge of the industrial services activities in the above Unit which provides a wide range of consultation, research, development, system design, constructional and production facilities

The post is the initial appointment of a group within the Unit specifically assigned to foster relations and to provide services for industry on a wide range of microprocessor applications. The ability to work directly with senior industrial engineering and management personnel is essential. The successful candidate (male or female) will have responsibility for the planning and progress of industrially related projects. A high level of qualification and achievement coupled with current experience of project design and management in the microprocessor or related industrial/computer field is desirable.

Salary on a scale £7,074-£8,730 per annum (under review).

Further particulars may be obtained from the Registrar, P.O. Box 88, Manchester, M60 1QD. Quote reference EEE/1467BC. Closing date 29th September, 1978.

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At least 2 years' OPERATIONS experience?

If you are a freelance operator now, or intend to go freelance in the near future, contact us for details of our current and future assignments in all areas of the U.K.

The ability to communicate and an intelligent attitude towards freelance work is considered essential.

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IBM OS VS1/2 OPERATORS
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IBM DOS VS GRASP OPERATORS
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ICL 2960 VMEB OPERATORS
ICL G3 OPERATORS
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(24-hour answering service) for more information

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COMPUTER PERSONNEL CONSULTANTS LICENCE NO. SE(S)62

CW 24/8/78

Polaroid, internationally famous for 'instant picture' cameras, film and photographic equipment are seeking the following people to assist in the continued developments of their expanding operation.

Systems Designer

c£6,000

The successful applicant will have full project management responsibility for new applications and will work closely with user management. He/She will be involved in joint development projects with U.S. and European Polaroid locations and some degree of travel can be expected. Recent developments include online IMS database systems in Materials Management and Personnel, with others planned for a variety of areas including Finance, Purchasing and Production Control.

Candidates should have 3 years systems analysis experience preferably in a manufacturing environment. Financial systems experience would be an advantage. IMS experience is not essential as training will be given.

Data Administrator

c£6,000

As part of our continuing expansion into online database systems we require a Data Administrator to be responsible for data definitions and descriptions within our systems. It is planned to extend the concepts of data management to both manual and computer systems. This is a major undertaking for the successful candidate in a relatively new field of data processing. He/She should have several years experience within a manufacturing environment. A data processing background which includes Cobol, IMS OS and the Datamanager Dictionary system is desirable. Training will of course be available where required.

Our modern plant is situated close to Loch Lomond and the Trossachs. The district has the widest possible range of leisure facilities and reasonably-priced housing is available.

As a sophisticated international company Polaroid offer a highly competitive salary and excellent conditions of employment. A generous relocation package is available if appropriate.

Telephone Alexandria 54141 for an application form, or write to Personnel Department, Polaroid (U.K.) Limited, Vale of Leven Industrial Estate, Dumbarton.

POLAROID

1977

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

ANALYST PROGS.

Northern England c £7k

We are recruiting on behalf of a large commercial manufacturing concern who require a number of experienced analyst programmers, preferably with Cobol in their background, to join a new team enhancing their current PDP11 network.

The positions will be based in Leeds, however, travel within the U.K. will be necessary on occasion.

Applicants should have at least 2-3 years' experience in data processing gained in a commercial environment.

A number of people with lesser qualifications and experience are required by our client to participate in their excellent in-house training scheme.

The fringe benefits and career prospects within this company are excellent as is the working environment.

For further details and a confidential discussion, please contact Tony McGrath.

SOFTWARE PEOPLE

London & H. Counties £4-10k

Our client is currently seeking programmers and analysts with solid experience on any major international mini or micro such as DG Nova, PDP11, GEC 4000 and Intel 8080 series.

Professionals with practical experience of systems software work in the areas of I/O handling, disc monitors, assemblers, or high level compilers will be especially interesting, as would people with industrial systems experience on minis or micros.

A programmer with specific experience of MACRO II under RSXIIM, and I/O driver writing would be of particular interest, especially if coupled with message switching and terminal control.

No matter how little or how much assembler and software experience, why not discuss your situation with me.

Contact Derek Pearson.

PROJECT LEADERS

London c £9k

GET ON LINE with one of the most progressive installations in the country.

The true data processing professional will realise that 'batch' is out and distributed processing is in. Realising this you will have probably been searching for this opportunity for some time. The company for whom we are recruiting already have a sophisticated network and are now looking to enhance this further throughout the U.K. and Europe.

Applicants for these positions will be expected to have a thorough grounding in systems analysis, preferably with a programming background, which you will have gained in a commercial environment. Whilst previous experience of project leadership would be an advantage, applicants with potential will be given every consideration.

For a full and confidential discussion, please contact Tony McGrath.

CUSTOMER ENGINEERS

Sheffield c £6k + Car

Experienced minicomputer engineers are needed by our client to maintain the sites they have in the above area.

Working on powerful modern computer systems manufactured by the company, there is considerable scope for personal development in both technical and management areas.

Being the representative of the company, it is essential that the new members be independent and conscientious, with experience of customer liaison. Technical competence is also important, but the company will be providing a thorough training on all the equipment they will be maintaining.

A company car will be provided, and there are numerous other valuable benefits. Relocation allowances may also be available for the right person, but this is negotiable.

For a positive career with a respected company, contact Peter Gorton.

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Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

KNIGHTS KNOW HOW

DATA PROCESSING CONSULTANTS SINCE 1970

Support Analyst

W. LONDON

One of the fastest growing subsidiaries of an international mini computer manufacturer is moving shortly to brand new offices located W. London, adjacent to tube route. They are seeking an analyst to maintain a high level of back-up technical support within their group applicants should be familiar with small/medium mini computers, with additional knowledge of IBM VS or system 3 useful but knowledge of COBOL essential

- ★ Company expect to expand by 50% in the coming year.
- ★ Excellent training in BASIC and all hardware/software in their product ranges.
- ★ RELOCATION expenses.
- ★ Salary: to £6,500 + COMPANY CAR.

Ref. 1709

Analyst Programmer

CITY

Old established Merchant Bank has opportunity for person with COBOL and PL/I experience to work primarily as a programmer but also be involved with analysis — would ideally suit ambitious programmer with desire to do more than just coding. This position is in the "investment" area but company will consider any good commercial background, DL/I Database is currently being developed, for which FULL TRAINING will be given.

- ★ Large budget allocated for training purposes.
- ★ Variety of new development including DL/I DATABASE.
- ★ First rate opportunity to follow an excellent career path.
- ★ CHEAP MORTGAGE and insurance, low interest loans, season ticket scheme and excellent Sports/Social club.
- ★ Salary: £6,000.

Ref. 1711

Snr. Programmer

LONDON

Our client, an international company centrally located seeks a good programmer with sound COBOL experience. Working in a team which is principally engaged in the development of systems used to support the company's telecommunication activities throughout the world. Their equipment is ICL 1900 series but will consider other machine experience.

- ★ Continued development with a well planned schedule.
- ★ Good promotional prospects.
- ★ Progressive organisation.
- ★ Opportunity to learn new languages and get on to MINIS.
- ★ Salary to £5,300.

Ref. 1700

Programmers

ESSEX

Management services division of major British group with annual turnover of almost £100m seeks COBOL programmer with minimum 2 years' IBM or ICL COBOL within a project team. Programmers will become involved in program design, coding, testing and documentation as well as assistance in systems implementation. Company offers:

- ★ Comprehensive range of applications.
- ★ Opportunity to move to more advanced technical projects and variety of languages and machines.
- ★ Paid overtime — flexi hours — subsidised restaurant amongst many of the excellent perks.
- ★ RELOCATION expenses.
- ★ Salary to £5,500.

Ref. 1624

Systems Analyst

LONDON

Highly reputed firm of Merchant Bankers with world wide business interests are seeking Systems Analyst with either financial or insurance experience to work as a key figure within their D.P. services division. Ideal applicant should have worked in an IBM installation but any other hardware experience considered.

- ★ Excellent working environment.
- ★ Job security.
- ★ Full banking benefits including subsidised mortgage and personal loans.
- ★ Salary: £7,500.

Ref. 1594

Programmers

MIDDX.

A major organisation in the retail trade is now pursuing further interests at a rapid rate. Retaining NCR Century equipment with new Criterion scheduled for delivery at the end of year, they seek programmers with COBOL experience on any machine for a major system utilising TOTAL database.

- ★ Plenty of new development work.
- ★ Training in Database.
- ★ Sports and Social Club in beautiful grounds, heated swimming pool, squash club, etc.
- ★ Excellent perks, LVS, Discount on company goods.
- ★ Salary to £6,250.

Ref. 1656

For further information please telephone or write to our London office: 01-734 0152/3010 (24 hrs.)

CONTRACT DIVISION

U.K.

PDP BASIC + RSTS/E	BUCKS	£220+p.w.	IBM OS COBOL	LONDON	£200 p.w.
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PDP MUMPS	LONDON	£200 p.w.	IBM IMS COBOL	HERTS	£220+p.w.
PDP MACRO II RSXII	LONDON	£210+p.w.	BURROUGHS 6700 COBOL	SURREY	£200 p.w.
IBM OS PL/I	MIDDX.	£200 p.w.	HONEYWELL 66/00 SNR PROG/DESIGNER		
IBM OS PL/I	S. COAST	£220+p.w.	ICL COBOL/PLAN	LONDON	£230 p.w.
IBM IMS PL/I OS	S. COAST	£250+p.w.	ICL 2900 VME/B COBOL	LONDON	£180+p.w.
IBM DOS COBOL VSAM TSO	LONDON	£200 p.w.		N. LONDON	£230 p.w.

Computing Services Association

OVERSEAS

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SYST 32/34 RPGII	BRUSSELS	£340 p.w.	HONEYWELL 61/62 COBOL	HOLLAND	£320 p.w.
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Ring Christine Kay/David Hayton: Tel. No: 01-734 0152 (24 hours)

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MID-GLAMORGAN COUNTY COUNCIL

County Treasurer's Department

SYSTEMS ANALYST

(Commercial Project Team)

SYSTEMS ANALYST

(Borough Council Project Team)

Salaries £4245-£5568 inclusive of nationally negotiated supplement.

Commencing salaries will depend on qualifications and experience. The authority currently operates an ICL 1904S computer and is now actively planning for the introduction of an ICL 2972 computer next year.

Applications are invited for these vacancies which exist within project teams concerned with the development of commercial systems and programs.

A minimum of one year's systems experience is desirable and applicants must hold a relevant qualification.

Flexible working hours scheme is currently operating.

The County Council's scheme for the payment of lodging and attendance allowances and removal expenses will apply.

NATIONAL CONDITIONS OF SERVICE.

Application forms (to be returned by 11/9/78) are obtainable from the County Treasurer, Mid-Glamorgan County Council, County Hall, Cardiff.

CANVASSING WILL DISQUALIFY

UNIVERSITY OF MANCHESTER

2 Project Leaders

Administrative Data Processing

£6,317-£7,754 (£8,250 with effect from 1.10.1979)

The Administrative Computer Unit provides a computing service to administrative departments in the University of Manchester on a 128K I.C.L. 1902T. In addition to a wide variety of batch systems, several interactive on-line systems have been developed under T.P.S. An ambitious programme of development for the next five years and beyond has been started, and to help with this the Unit now needs two additional Project Leaders.

1. PROJECT LEADER — Systems Programming

Applicants, preferably with a degree or equivalent qualification in Computer Science, should be capable of maintaining and developing existing systems software and providing technical advice to the Unit on the purchase of further software packages. Some years' experience of 1900 hardware and software, probably in a commercial environment, are necessary and a knowledge of T.P.S. would be advantageous. An ability to communicate effectively with staff of all levels is important.

2. PROJECT LEADER — Data Processing

Applicants, who should have several years' experience of COBOL programming and systems analysis in a commercial environment, must be able and willing to accept total responsibility for a system from specification to implementation. A personality which will permit an easy working relationship with users is essential. A knowledge of I.C.L. 1900 equipment and software would be advantageous, especially if this includes on-line experience.

Both posts will be in Administration Grade II, and benefits include a good contributory pension scheme, 30 days' annual leave plus public holidays, and good meal and recreational facilities.

The University is situated near the centre of the city with a wide variety of housing and amenities within easy reach.

If you would like further details or would like to discuss these appointments with the Executive Director or Data Processing Manager, please ring 061-273 3333, extn. 3788 or 3755 (8.15 a.m. to 5.30 p.m.) or 061-432 1538 after 7 p.m. Written applications giving full curriculum vitae should be addressed to the Registrar, University of Manchester, Oxford Road, Manchester M13 9PL, to arrive not later than August 31, 1978. Quote ref. 207/78/CW.

MORE JOBS THAN EVER!

[illegible]

London and Home Counties

If you have experience in ASSEMBLER or microcode or communications for at least 1½ years then a whole exciting field is open to you. We now have opportunities in SW, NW or W London, Surrey, Berks and Hertfordshire for competent people in this rewarding field. The future is definitely going to be with the MINI-computer professional. Telephone for details. CW34/1 Michael

SENIOR SYSTEMS ANALYST [illegible]

C. London

If you have installed at least one major application involving IBM Data Base or a T.P. system then this job will appeal. This international company has a formidable record for DP innovation. Excellent perks include free lunches, non C.P.S., four weeks hols and discounted insurances. CW 34/2 Michael

[illegible]

Central London

Six large, well established consultancies wish to recruit systems people with all-round experience on third generation equipment and the right personality to deal with clients who require first-rate service. Technical communications consultants are also required where in-depth implementation experience of IBM or ICL T/P message switching networks etc. are essential. Excellent fringe benefits and prospects. CW 34/3 Michael

[illegible]

S.E. England

If you have 3 months' or more experience give us a ring. We have a very large selection of jobs. CW 34/4 Patricia

[illegible]

Enfield

Work for an installation here to start. All, at least 1 yr + IBM OS experience. Perks include removal expenses, C.P.S. and paid overtime. CW 34/5 Patricia

[illegible]

N. London

A major manufacturing organisation with a 2 shift ICL G III installation requires an experienced senior ICL operator. This company offers free meals, C.P.S. and four weeks hols. CW 34/6 Patricia

[illegible]

Nr. Hounslow

A famous Service Bureau with two locations needs ICL GIII + experienced operators. Perks include non C.P.S., four weeks hols. Salary reviewed in September. CW 34/7 Patricia

[illegible]

W.1

This international company has an IBM 370 DOS/VS computer working on only 2 shifts. They offer terrific company perks including non-C.P.S., free lunches, discounted insurances and four weeks hols. CW 34/8 Patricia

[illegible]

UK/Overseas

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IBM Assembler/MVS	Essex 3M
ICL Sys/4 Usercode	Liverpool 4M
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or Programmer willing to learn RPG 2

New computer department based in BIRMINGHAM has two System 3 Model 15 CPUs with a TP network serving nine locations in the UK

Interesting work, good salary and usual large company benefits.

Please contact

Mr. R. G. Johnson
Building Products Division
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Argyle Street, Birmingham B7 5TW
Telephone: 021-328 0466

City Office requires an experienced (minimum 12 months) ICL2904 COBOL PROGRAMMER to complement a small team engaged in computerising commodities. Real time programming is executed in Applications Manager in which training will be given if necessary. Salary according to age and experience.

Please apply to The Data Processing Manager, C. Czarnikow Limited, 66 Mark Lane, London, EC3. (01) 480 6677 Extn. 250.

CAPITAL APPTS.

FORTRAN

Programmers urgently required for Industrial and Scientific Development. £3,500-£8,000.

ALL AREAS

Phone for free list of vacancies

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637 5551 day; 636 9659 eve.

UNIVERSITY OF GLASGOW.

DEPARTMENT OF NATURAL PHILOSOPHY
KELVIN LABORATORY

SYSTEMS ENGINEER

The Kelvin Laboratory, which is a research unit of the University engaging in Nuclear Structure Physics, has a vacancy for a Systems Engineer. The central computer in the laboratory is a DEC-System-10 multi-access, time sharing system. This is linked to several mini-computers the chief function of which is data acquisition for the two electron linear accelerators. The post of systems Engineer involves hardware and software development in support of all the above equipment, and the provision of advisory services to the research staff. A major expansion of the facility to include links to S.R.C. computer networks is scheduled for September this year, and a variety of new ancillary equipment will subsequently be installed on a front end processor.

The salary will be in the range £3384 to £6120 plus superannuation scheme benefits. Applicants should write before 9th September 1978, stating age, qualifications and experience to Dr. R. O. Owens, Department of Natural Philosophy, University of Glasgow G12 8QQ.

In reply please quote Ref. No. 4220CP.

UCSL Anglia

OPERATORS

NORWICH around £3000

We are an expanding computer service bureau within the **Unilever Group.**

We currently have a vacancy for an IBM Operator with at least one year's experience.

A **DOS/GRASP** background is preferred, but not essential.

East Anglia is an attractive part of the country, where housing is still very reasonable.

For further information or an application form please contact Carolyn Bennett.

Anglia Data Services Ltd., Chapelfield, Norwich NR2 1RW
Telephone (0603) 60655/6.

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for Systems up to £6,800 p.a.

We are currently looking for a wide range of Programmers to work on our advanced systems products in the fields of traffic control, fuel dispensing, passenger control, control systems for police forces and automatic vehicle location.

The range of work and technology is wide involving 'state of the art' techniques in microprocessor usage within a real time environment, in addition to interesting and sophisticated work using mini computers.

In addition to the expansion of our current business we have a progressive, forward-looking development programme. There are therefore positions available at all levels which will be attractive to any Programmer who wishes to be part of an expanding international business engaged in high technology areas.

FREEPOST - no postage necessary just write GEC TRAFFIC AUTOMATION LTD. FREEPOST, BOREHAMWOOD, HERTS. WD6 1BR or Telephone P. Heywood on 01-953 2030 Ext. 3377

I have experience over
☐ 2 years ☐ 4 years ☐ 6 years ☐ longer

My present salary is in the range of
☐ £3500/£4500 ☐ £4500/£5500 ☐ £5500 plus

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IBM Cobol programmer for South West London, three years plus experience, DOS. OS Conversion and maintenance of mail order package — some travel to France necessary. 'O' level French an advantage. Salary to be negotiated

Apply to

Personnel Manager, 19 St. Ann's Crescent, London, SW19.

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Require an

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(location Slough) to assist the Communications Manager in the design and maintenance of Electronic equipment associated with data communications. A familiarity with mini/micro computers and/or data communications equipment is desirable but not essential. Salary c. £6,000 p.a.

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A major UK Software House is expanding its successful ICL System Ten Operations in the London area. Excellent career prospects are offered to the following staff.

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We are looking for fluent ASSEMBLER programmers interested in a new involvement with Systems Ten Software. A background in Analysis/Design or System Ten experience would be ideal. Opportunities will exist to take on project responsibilities. Minimum experience in DP: 5 years. **Ref. 529/CW/RN**

Senior Consultants Project Leaders to £8,300

We are also interested in more senior applicants who are experienced leaders and have been responsible for design, production and implementation on at least one major product. Minimum experience in DP. 7 years, ideally including some System Ten. **Ref. 530/CW/RN**

As most projects will be dealing with business systems and communications in a Real Time environment, Hotel Reservations, Insurance Broking and Communications software experience would be of particular interest.

To apply for any of the above positions or for further information, please telephone or write to Renee Nute on 01-242 9356. If it would be more convenient to telephone in the evening, the telephone number is 01-874 6372.

Computing Services Association

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COMPUTER OPERATOR REQUIRED
South London~c.£3,850

A vacancy exists for an operator with at least 12 months' experience on any mainframe but NCR would be an advantage. The successful applicant will be able to develop their experience working a 2-shift system on an NCR Criterion N-8570 operating under B3. Here is an opportunity to join a small team in a fast-developing installation with the prospect of transferring to programming at a later date. Further details from the Computer Services Manager.

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4th Floor, Crown House, Morden
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PROGRAMMER/ SYSTEMS PROGRAMMER

£4,425-£4,812 **Ewell**

For North East Surrey College of Technology. To assist the Computer Manager in providing the College with a Computer service in a wide range of system and application areas. This is an ideal opportunity to gain valuable experience in the use of a modern timesharing minicomputer system (Varian V76). BASIC, FORTRAN and TASC are available ON-LINE. In addition we are currently investigating the use of micro-processor systems in the education field.

Candidates should be qualified to at least A-level standard and should have several years' experience in computing including use of high and low-level languages and preferably some knowledge of londwave. Opportunities for further training are also available.

Application form from Chief Administrative Officer, North East Surrey College of Technology, Reigate Road, Ewell, Epsom, Surrey, KT17 3DS. Please quote reference: CAO/59/23.

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SYSTEMS ANALYSTS to £6k

If you have one or more years in Systems and like working for a Manufacturing Company involved with developing new systems, then our Client would be very keen to see you to discuss existing career prospects. Expertise of IBM Mainframe Computers would be a distinct advantage. 1CA17

SYSTEMS ANALYSTS to £6.3k

Our Client is seeking at least three good systems people to help them develop their Real-Time MIS projects. Based on a number of Univac 90/30 machines the current system is supporting over 145VDU's. If you are interested in gaining excellent on-line experience in a dynamic environment with first class prospects, please do not hesitate to phone us immediately. 2CA17.

ANALYST PROGRAMMERS to £5.5k

If your background relates to IBM 370 Cobol preferably with some Assembler and you like working in a progressive atmosphere developing new systems then our Client would be very interested in talking to you about your future. Numerous large company benefits are offered. Please phone now for immediate assessment of your chances. 3CA17.

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Our Client, a large manufacturing and wholesale company is seeking competent Analysts and Project Leaders to help them enhance and develop their business. Centred around an IBM mainframe configuration, these opportunities provide you with an excellent chance of furthering your career locally. Phone now for details. 4CA17.

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If you have good PL1 experience and have the ability to motivate and inspire people to produce good Systems under your guidance or if you have expertise in design of advanced systems then our Client would be very interested in talking to you about your future prospects with them. Phone us immediately for more detailed information. 5CA17.

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Our client is located in a rural setting where housing and living costs are very modest. The configuration consists of a large IBM 370 grouping operating in Real Time mode and supporting over 100 VDU's. If you have sound financial systems experience and/or Cobol/Assembler and you fancy cutting costs all round, including travel, then please do not hesitate to telephone us now. 6CA17.

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Only two years experience of IBM 370 Computers using BAL or PL1 could land you in a lucrative position with this very progressive company involved in the financial and insurance markets. A 4% mortgage is also offered, together with the normal large company benefits. 7CA17.

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If you have only 19 months Cobol experience preferably with IBM 370 Computers then here is an ideal opportunity to move quickly for a high salary and excellent prospects. Our client is a large dynamic Chemical concern. Don't hesitate to get in touch for more information. 8CA17.

CENTRAL LONDON

SENIOR OPERATIONS RESEARCH ANALYST to £8k

If you can supervise and possess experience in Linear Programming and have sound operational research ability, then our Client would like to talk to you immediately to gauge your suitability for this very interesting post. An IBM background would be to your advantage. 9CA17.

If you can't see anything here that suits you, still get in touch with us — we have many additional well paid vacancies in Essex and the City.

Telephone John McLean for an up-to-date list of current opportunities on

BRENTWOOD (0277) 212021

or write to him at

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From COMPUTER WEEKLY July 27 1978 page 23

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London
We're holding regular seminars in recruitment to help you advertise with the maximum cost-effectiveness. Brian Durrant (phone numbers above) will be happy to tell you more.

From COMPUTER WEEKLY August 10 1978 page 21

THIS ADVERTISEMENT APPEARS BY VERY SPECIAL REQUEST.

Everything, in fact, in Computer Weekly appears by very special request . . . because copies of this weeks issue are personally asked for by 90,841 key computer personnel: a requesting readership 40% higher than that of any other computer journal. Yet to advertise to this vast, committed audience costs LESS. (£10 per single column centimetre. Nearest competitor: £12.) What's more, you can advertise here faster. Our copy date (12.00 hrs. Tuesday) is more than 24 hours later than our nearest competitors.

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From COMPUTER WEEKLY August 3 1978 page 43

Radio commercials
boost these columns across the nation.

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Every month Computer Weekly International reaches 94,000 DP professionals in Western Europe. Many are interested in working here.

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From COMPUTER WEEKLY August 17 1978 page 23

COMPUTER WEEKLY

THE INDUSTRY'S WIDEST READ AND MOST REQUESTED NEWSPAPER

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We are about to start development of a family of processor controlled products that will introduce a new kind of intelligence into the world telephone network. Initially the product will be aimed at a wide variety of export markets and the first task of the selected candidate will be to develop on-line and support software structures that minimise job engineering effort.

Applicants should be capable of optimising trade off between hardware and software and between standard and application programmes. It is expected that the required perspective would have been gained through some years experience of developing complex real time communications products.

This is a key position in a new and expanding Division and the remuneration package will fully reflect its importance. For further details please phone David Leevers on 01-368 1234, extension 2661 or write to Tom Kerr, Switching New Products Division, Standard Telephones and Cables Ltd., Oakleigh Road South, New Southgate, London N11 1HB.

STC Changing the face of communications worldwide

LONDON BOROUGH OF BARNET
Borough Treasurer's Department

COMPUTER STAFF

This is a large Authority currently operating an ICL 1903T under George 3 running a variety of batch and terminal work and a comprehensive on-line enquiry system. We are upgrading to an ICL 2960 in September. Training in ICL 2900 and VME/B will be provided. There are vacancies for

SYSTEMS ANALYST
Grade AP.1/5 — £3,108 to £5,358 p.a. (inclusive) — Reference 253

A person with at least two years' experience in programming/systems analysis to work in a small team designing and supporting application systems.
A computer related degree or the NCC Certificate in Systems Analysis would be an advantage.

PROGRAMMER
Grade AP.1/5 — £3,108 to £5,358 p.a. (inclusive) — Reference 259

Two years' experience in 1900 Cobol and/or Plan required to assist in developing and maintaining a wide range of applications including conversion to 2960.

COMPUTER OPERATOR
Grade C.3—£4.418 to £4,739 p.a. (inclusive) — Reference 271

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Separation allowance payable up to six months, or longer in exceptional cases. 100% of removal expenses. Interest free loans for the purchase of annual or six monthly season tickets, additional leave at public bank holidays.
Application forms available from Room 46, Borough Treasurer's Department, Town Hall, Hendon, London NW4 4BG, telephone no. 01-202 8282, ext. 120, quoting reference number of post applied for. Closing date 8th September, 1978.

THANET JOINT COMPUTER COMMITTEE
require

SYSTEMS ANALYST/PROGRAMMER

To work for a go-ahead Seaside Organisation
AP5/SO1 £4,773-£5,568 (inc. of supplement)

The Thanet Joint Computer Committee, who provide computing service with a Honeywell 62/40 for the Thanet and Dover District Councils, require a suitably experienced person to head one of the two-man analyst/programmer teams maintaining existing systems and developing sophisticated new systems. Consideration is being given to the use of on-line applications by both user authorities.

Applicants should preferably have a sound knowledge of systems analysis in local government and programming in COBOL.

Consideration will be given to housing accommodation and a generous disturbance allowance scheme is in operation.

Closing date 26th August, 1978
Interview date 8th September, 1978

Applications giving full details of experience to date to

The Computer Manager, Thanet Computer Centre
Haine Road, Ramsgate, Kent CT12 5AA

HARRIS COMMUNICATIONS AND INFORMATION HANDLING

TRAINING INSTRUCTOR/ TECHNICAL SUPPORT ENGINEER

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- Good Salary
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Harris Systems Limited, 35/37 Bury Mead Road,
Hitchin SG5 1RT

Anglian Water Authority

PROJECT LEADER BUSINESS SYSTEMS

Ref: H3D006 £7,776-£8,352
(including supplement of £312)

The Authority is implementing a regional computer service based on the use of database and data communications techniques. A network of high-speed lines connects the Authority's 19 divisions to the Honeywell Dual 66/10 installed at Huntingdon.
Within this computing framework a major customer billing and enquiry project is currently under development, and it is proposed to commence a wide variety of financial, business and management information systems in the near future. A Project Leader, reporting directly to the Business Systems Manager, is required to assist with the planning and control of the development of these systems.

Applicants with experience of computing at a senior level must have had responsibility for controlling major computer projects from initial investigation through to implementation. Experience should include extensive practical knowledge of data management concepts.

We are located in Huntingdon, an area of reasonable housing costs which offers a wide range of leisure pursuits. With Cambridge only a half an hour away — and within 1 hour of London by train, the overall quality of life is high. The Authority offers excellent conditions of service and generous removal expenses if relocation is necessary.

If you are interested or want to know more about these opportunities, why not call Jenny Spencer at Huntingdon (0480) 56181 ext 370 for information and an application form.

The closing date for application is 8th September, 1978 and should be sent to:

ANGLIAN WATER AUTHORITY
Brook House, Ouse Walk, Huntingdon
Cambs

Solomon Islands

Programmer/ Analyst

A Programmer/Analyst with a diploma in programming and at least 5 years' relevant experience, is required by this attractive group of Pacific Islands.

Responsibilities will include the maintenance and updating of existing programmes, the writing and implementation of new ones and the training of local staff.

The computer complex is composed of NCR 399s plus matrix printers and NCR 7200s using batch processing in payroll, accounting and bill paying programmes, with an anticipated extension to stores and statistics.

Arrangements will be made for the successful candidate to attend the NCR programming course if necessary.

Salary is up to the equivalent of £7239 p.a. including a substantial tax-free allowance paid under Britain's overseas aid programme. Basic salary attracts 25% tax-free gratuity.

Benefits include free passages, generous paid leave, children's holiday visit passages and education allowances, outfit allowance, appointment grant and interest-free car loan.

For full details and application form write quoting MR10/706/CD.

Crown Agents

The Crown Agents for Oversea Governments and Administrations, Recruitment Division,
4 Millbank, London SW1P 3JD.

ICI PLASTICS DIVISION
BEXFORD, MANNINGTREE

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The qualifications required are as follows

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An in-depth knowledge of IBM Job Control Language.

An appreciation of PL1.

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The salary will be around £5.300 plus bonus, profit sharing, etc.

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c.£10,000 + car **Birmingham**

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—and you have a minimum of 12 months' COBOL programming experience, then this could be a good opportunity to accelerate your career

Ref. W3/2408

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Ref. W5/2408

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Ref. S2/2408

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Ref. W4/2808

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ANALYSTS AND PROGRAMMERS

LOCAL INTERVIEWS FOR LOCAL JOBS.

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(C/78075)

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(C/78076)

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(C/78077)

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(C/78078)

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Programmers

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RW 34/1

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RW 34/2

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Letters of application stating age, experience, qualifications and present salary should be sent to the Registrar, University of Salford, Salford M5 4WT, by 11th September, 1978, quoting appropriate reference.

THE SALES BIT

How to respond to errors of judgment

ACCIDENTS will happen! Everybody makes mistakes! These expressions roll off the tongue easily. Yet when such incidents occur they are always the source of considerable anguish and frustration.

The salesman often finds himself in a difficult situation which has resulted from an error in someone's judgment. That person could be himself, a colleague or even his client.

The nature of mistakes is such that they always come as a surprise. Areas of possible error can be anticipated but not individual events, otherwise they would never occur in the first place. Certainly, problem areas, which are anticipated, tend to generate items of lesser impact than those ignored.

However, when the salesman is "hit" with the reality of a mistake, he is usually caught unawares, particularly if the situation is revealed by the client rather than his own company.

The instinctive reaction of many salesmen is to blame some other person, organisation or situation. He needs to sustain a good relationship with his client and wants to avoid any factor which might impair it. After all, making a mistake is really letting someone down, and the client needs to know that the salesman can be relied upon.

Client: "We specially ordered a 'European' print-barrel and you've delivered an American one."

Salesman: "It must be the US factory, we're always having that kind of problem."

Client: "I didn't receive the literature you promised to send me."

Salesman: "I shall be having some strong words with my secretary."

Client: "I'm sorry, but I gave you the wrong specification."

Salesman: "Oh dear! That's going to create some problems, I can tell you!"

These kind of responses from salesmen are common whenever mistakes occur, yet their effect can be very damaging in the context of the client's regard for his supplier as a total entity. The inevitable conclusion from this type of cover-up is that the salesman is trying his best but the company is inherently unreliable.

The fact is, we all do make mistakes and what is more, we all know we make mistakes. So, that is obviously the basis on which the salesman must handle the client's reaction to errors in judgment, if he is to lessen the impact of their effect.

How does he do it? By always blaming himself, or at least stating that he could have made some contribution to the mistake being avoided. This applies to whether the mistake has been made by a colleague, the client or, of course, the salesman himself.

The mistake situation consists of two main factors, the practical and the emotional. The former is what it is and has to be dealt with accordingly, whereas the latter has a significant "Topsy" factor and can sometimes become more difficult to handle than the actual problem itself. By blaming himself, the salesman tends to defuse the emotional aspect of the matter.

So, to the client who received the wrong print-barrel: "If I had double-checked, before it was despatched, it probably would not have happened. I'm sorry, I'll give the matter absolute priority."

And to the one who didn't receive the literature: "I'm sorry, I should have delivered it personally."

In the case of the client who supplied the wrong specification, the salesman obviously cannot take the blame for the error if work has been done and has to be paid for, but he can, at least, be sympathetic and reassuring by relating himself to the situation rather than being negative and uninvolved: "It's easily done, I might have made the same mistake myself. Don't worry, I'll do my best to rectify the situation."

This type of attitude and response can only enhance the relationship between a salesman and his client.

It is often said that we learn from our mistakes. I don't accept that philosophy at all. My belief is that we really learn from putting mistakes right. Many errors are made and left to fester. Putting it down to experience is a handy cop-out.

If a salesman is involved in a mistake, whether he caused it or not, it is his responsibility to discover why it happened, seek alternatives and ensure the situation does not occur again. That way he learns something. After all, there can be no greater embarrassment than making the same mistake twice.

I suppose we could always amend that well known adage to "Twice bitten four times shy."

TRADER

New premises for DI-AN

TO provide more space to expand its industrial computing systems, DI-AN Data Systems has moved into new premises at Mersey House, Battersea Road, Heaton Mersey, Stockport, Cheshire. Tel 061-442 9768.

Puzzle answer

THE Tens and Units columns provide the vital first clue. The Units carryover must be even; and further research proves it to be 2. This cuts down the possibilities for E, and 2 is the only value which gives a valid answer for N(6).

Once 2 and 6 have been found, attention can be turned to the left hand side of the sum, and equations involving F, I, O and U may be set up.

The complete sum is in fact 40,837,226 + 4,547,226 + 79,322 + 6,562 + 726 = 45,471,062.

Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth

Block 12 (Logical Block)

Despite Hex's objections, the gang have decided to deluge the System with Leibnizian Syllogistic acid, an exotic elixir distilled from a rare species of mushroom with several fascinating properties. It can be transmitted anomalously along wires, and it can cause computational paralysis. Meanwhile, Hex's relationship with Cleo has undergone a profound change.

Hex spent the next day with Zap, putting the finishing touches to their time-sharing system. It was configured around Dr Null's microprocessor and looked really stylish once the circuit boards and power unit were tucked snugly away in their smart matt black box. They named it the M5 (Multi-modular mega-micro machine). When it was built they showed their handiwork to Cleo for her admiration.

She surveyed it coolly, without passing any comment.

"Nice piece of workmanship, isn't it?" badgered Hex.

"You're just building up a little System of your own," she replied — a criticism not without force.

"At least it's ours," Hex answered.

"You have to admit," added Zap with relish, "that this little contraption really has Hex appeal."

This remark was enough to lift Cleo out of her somewhat sombre mood; and there the matter rested.

The M5 passed its benchmark tests with flying colours — including a version of the travelling salesman problem set in 10-dimensional hyperspace (which is where travelling salesmen should be set). It was time to bring it live.

"Who's going to be the first to try it interactively?" asked Hex.

"You and Cleo," proposed Zap. "Surely, it's time you made an honest android of her."

"No thanks," objected Cleo. "I don't want 115-volt currents coursing through my head."

"Such confidence!" retorted Zap.

"Let us three androids try together," interposed Lambda.

"There's confidence for you," said Hex.

"I'm game," Zap assured them.

They each plugged into one of the parallel interface ports and, synchronised by the 64MHz clock, logged on simultaneously.

Nothing happened.

After they had been sitting motionless like statues for about 10 minutes, Cleo wandered out into the bowl of the crater. Ascii was snoozing peacefully by the warm pool. To relieve the boredom she picked up a stick, prodded him into wakefulness, and threw it to the far side of the crater. He fetched her first throw but the second he left where it fell and, instead of retrieving it, sniffed intently at the crater wall. He had apparently caught the smell of an animal. Cleo left him to it and ambled back to join the others.

To her surprise, not to say consternation, they were sitting expressionless exactly as she had left them. They made no response to anything she said, nor did pinches or slaps induce any of them to bat so much as an eyelid. They just sat like waxwork dummies. She was relieved to notice that the status lights above Zap's brow were green, and the red System Fail indicator on Hex's chest was not illuminated. Apart from Lambda's instruction-counter register — which was flickering in a suspiciously cyclic pattern — these were the only signs of life. It was clear that she had to do something drastic.

All her life she had deliberately avoided learning about data processing. A sixth sense had warned her to steer clear of such things. But now she wished she hadn't. There were three small white buttons on the black box — marked On/Off, Load and Reset. She knew enough to realise that one false move on her part could endanger their very existence. Just ripping out the informatic umbilical cords that hung from the heads of her three comrades and linked them to the machine could have disastrous consequences. Similarly, just turning the power off might well leave them in a state of computational limbo from which she would be unable to rescue them. It was a heavy responsibility.

There was only one thing for it: by a process of elimination she deduced that it had to be the Reset button, so, taking her courage in both hands, she jabbed her forefinger into it.

A pitiful wail resounded round the cave, from three voices as from one. Hex and Zap sprang up, cracked their heads on the ceiling and, in falling, cracked their heads again against one another. They lay prostrate on the earthen floor. Lambda just collapsed backwards in a heap with a sigh like the deflation of a balloon.

"What have I done?" demanded Cleo of herself, mortified.

All attempts to rouse them failed. Her heart sank. It began to look as though she had precipitated the very crisis she had striven to avoid. It was quite possible that she had broken into their co-processing in the middle of some complicated mutual interlock from which they could now never be released, leaving all three in a perpetual wait state. It was too ghastly to contemplate.

In desperation, she scrabbled round on her hands and knees trying to understand how the M5 worked; but there were no instructions and no user manual — in short, no documentation. Every time she tried to log in, it gave her rude messages about her id-code.

As a last resort, she went outside to see if Ascii could help. She did not have to search for long: he almost bumped into her as he fled, yelping in stark terror, from the animal whose spoor he had been following. As Ascii scuttled into the shelter of the cave, she could see distinctly, shinning nimbly down the sheer rock face opposite, the creature he had disturbed. It was a huge man-like ape, covered in reddish-brown hair. She paused just long enough to estimate its height (it had to be eight feet tall if it was an inch) then darted back in the cave where Ascii, very agitated, was doing his mechanical best to tremble.

All she could hope was that the tunnel would prove too narrow for its massive bulk. It was not long before a giant shadow loomed menacingly at the entrance.

"Ne sentu timon," boomed a deep resonant voice. "Mi manghas nur vegetalojn."

Will the Abominable Snowman make a meal of them? Not Yet.

© 1978, Richard Forsyth, RAIS Timesharing.

Keeping cool with solar film

By Mike Gadd

During hot weather, most modern office blocks turn into veritable hot-houses and one way to keep computer installations cool is by coating the windows with special solar control films which can reduce solar heat build-up to manageable proportion.

هكذا من الأصل

Solar control window film, such as 3M's Scotchtint range, reduces both glare and solar heat gain during hot weather. This installation is at the University Computing Company's utility centre in Euston Road, London.

APART from one of the worst droughts in history, last year's blazing summer brought a host of sticky problems for anyone who worked behind large expanses of glass.

For office workers, these problems were nearly all associated with personal comfort.

The problems for many computer suite managers were much more grim. Apart from the human aspect — discomfort, lethargy and a consequent lowering of efficiency — there was the small matter of costly computer installations to keep cool. Most accomplished this by simply turning up their air-conditioning plants — preferring to accept the additional running costs rather than risk the expense of failed components.

Some DP managers were less affected than others. They were the ones who had decided to do more to control their working environment than simply rely on costly air-conditioning. By coating the windows of their computer rooms with special solar films — such as the 3M United Kingdom Limited's Scotchtint range — they reduced the dual problems of glare and solar heat build-up to manageable proportions.

Scotchtint, which is available in various grades and finishes, is a transparent polyester film which is vapour-coated with aluminium. The density and colour tint of this coating is varied according to the application for which the film is intended but it has been demonstrated to reduce glare by up to 82% and solar heat transmission by as much as 75%.

On an average summer's day a south-facing window generates up to 212 BTUs per square foot every hour. With no form of protection, or means of dissipation, this heat continues to build until the temperature behind the glass becomes almost unbearable. By applying Scotchtint A18 film this figure can be reduced to 54 BTUs per hour — representing a reduction of 75% or so per cent in heat gain.

In human terms this can result in greater comfort and efficiency, and, in purely practical terms, in greater utilisation of space — with people content to work near windows, for instance — and a reduction in air-conditioning costs. On the basis of current costs a saving of £1,200 per annum can be achieved on an installation covering 10,000 square feet of south-facing windows.

One leading DP company which has discovered these benefits is the University Computing Company, an international data processing and services company that numbers some of the top companies in Europe among its clients. At their Euston Road, London, computer utility centre they installed 3M's Scotchtint A18 film three years ago on the south-facing window of their main machine room on the advice of their architect, Peter Temple.

The computer installation consists of two Univac 1108s which are front-ended by two medium scale DEC PDP-9s and five PDP-8s. Data is passed from a modem installation in UCC's client centre — via telephone links — to another modem in the machine room which translates and passes it on to the PDP-8a in the front end. Here it is built into a block and then transmitted to the 1108 for processing.

Power for all this machinery is supplied by two massive 150 KVA alternators, and most of the energy is dissipated as heat into the machine room.

Under the machine-room floor the temperature is meant to be 65°F and, in the room itself, the controls are set for 68°F and a humidity level of 50%. Although this latter figure can safely vary by up to 6% or 7%, the parameters for temperature are not nearly as flexible with a maximum variation of ±2°F being allowed.

Computer maintenance is carried out by UCC's own trained staff on a regular basis but, apart from these routine stops, the machines are in operation round the clock seven days a week.

Failures in the air-conditioning plant have to be dealt with quickly. The danger can be gauged by the fact that the exhaust temperature of the central processor can reach 110°F within five minutes. If the fault has not been rectified within seven minutes important components within the machine start to burn out and the whole installation has to be shut down.

When UCC first contemplated installing some form of solar control they immediately discounted specially-tinted glass on the grounds of cost and the time required for installation.

In contrast, A18, like all Scotchtint films, is installed by companies like Durable Solar Control — who were the installers in this instance — with minimal disruption to normal office routine. A18 is 0.00?in thick polyester base film coated with an aluminium finish which provides an 82% reduction in glare and 75% reduction in heat gain, and also aids privacy by presenting a mirror-finish to passers-by.

According to Brian Craggs, UCC's director of engineering, they were mainly interested in savings on their air-conditioning bill which were "enormous".

"We were hoping to cut at least one compressor out of the air-conditioning system. Although I haven't any concrete figures, I am certain that we have managed that. Certainly, there has been a drop in our running costs. In addition, of course, we have created a much more pleasant working environment and increased our privacy into the bargain."